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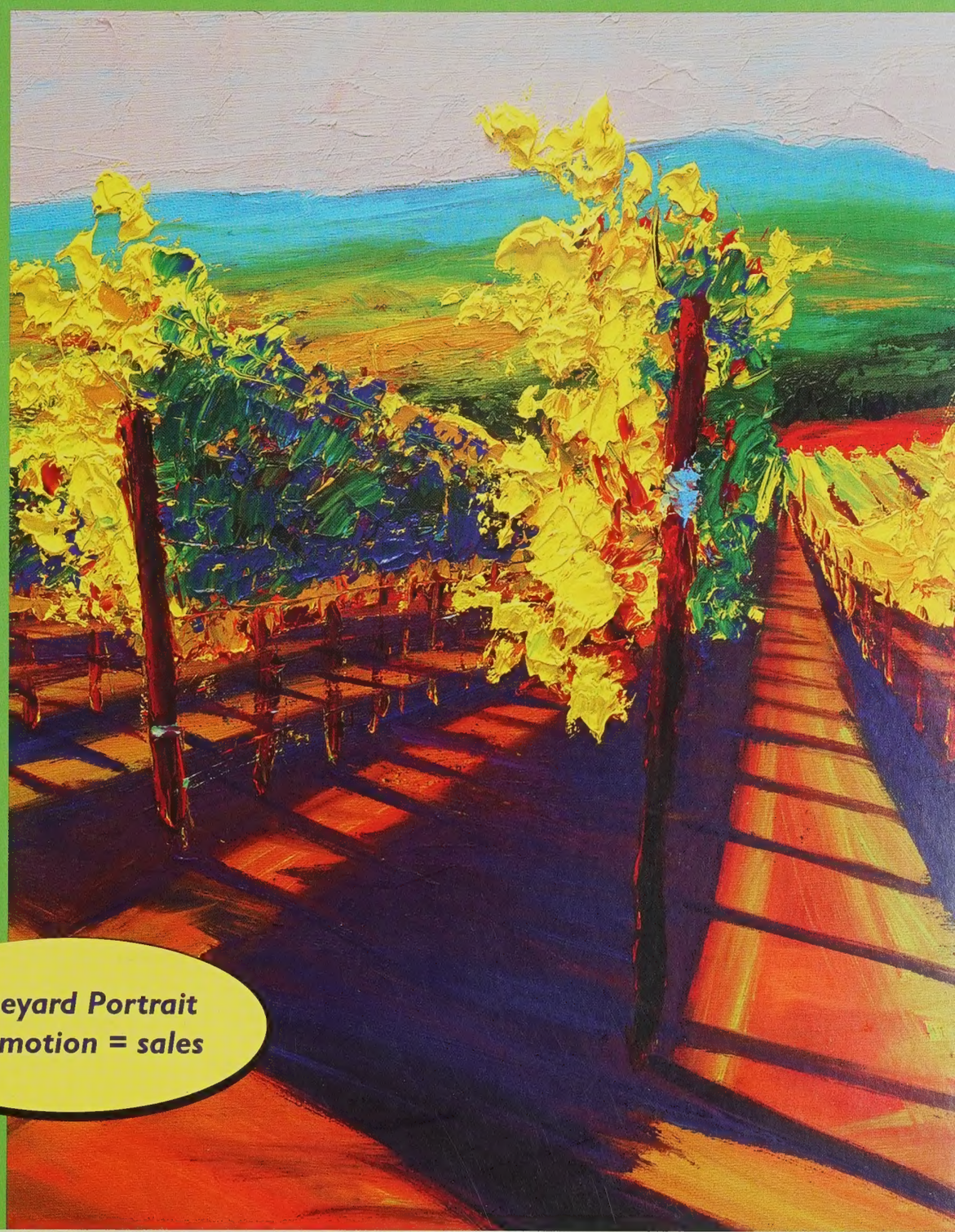

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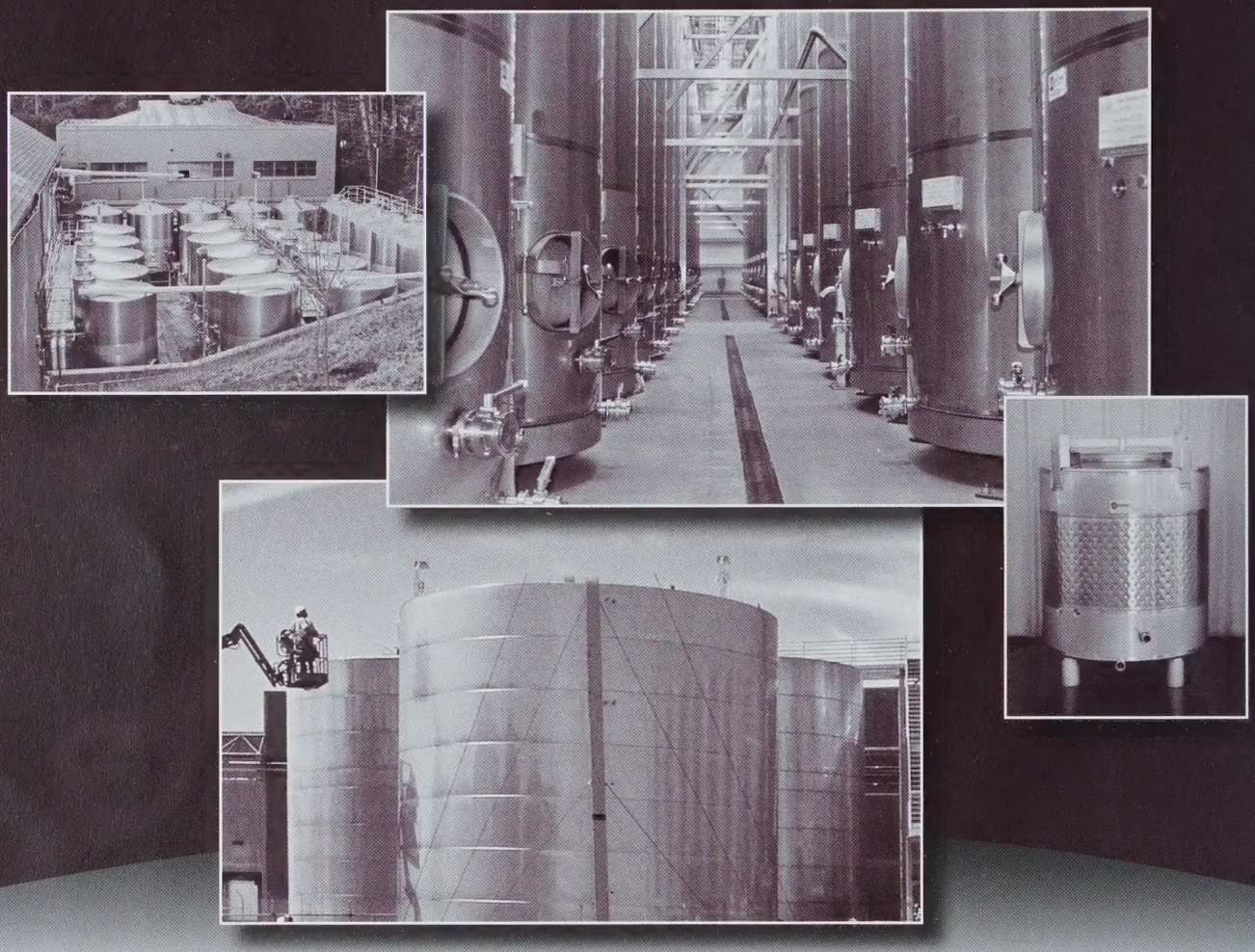

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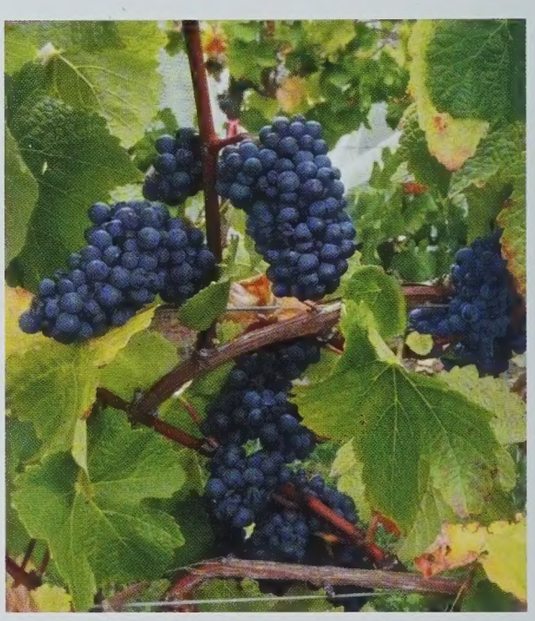

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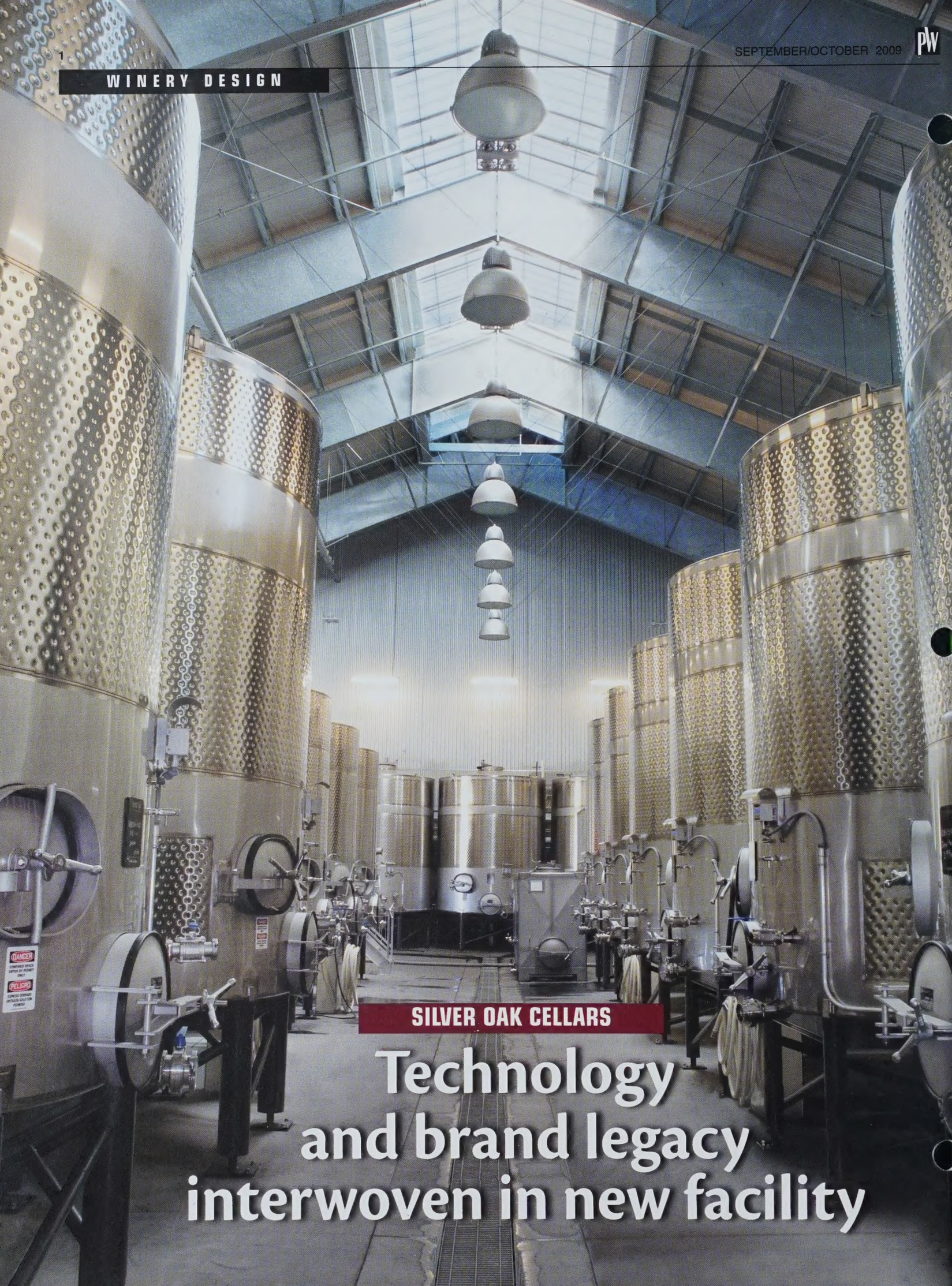
WINERY DESIGN



SILVER OAK CELLARS

Technology and brand legacy interwoven in new facility

**BY Tom Taylor, Partner,
Matt Hollis, Project Manager
Taylor Lombardo Architects,
San Francisco, CA**

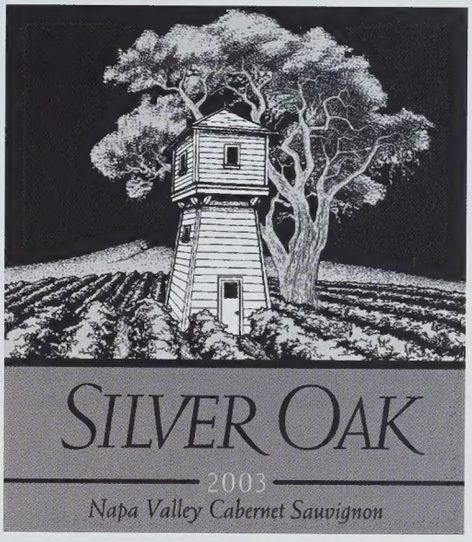
Silver Oak Cellars originally directed Taylor Lombardo Architects (San Francisco, CA), to design an interior remodel and a small strategic addition to its Oakville, CA campus. The existing structures varied in age and their complex configuration put constraints on production flow.

In January 2006, during the design process, a 100-year flood from the Napa River invaded the winery, that was followed by a devestating fire at Silver Oak Cellars in the same month. Both events elevated the required design solution from a relatively modest renovation to a complete demolition and redesign.

Because of Silver Oak's high public profile and loyal customer base, substantial efforts were made to maintain a connection to the winery's heritage. High winery visitation at both daily and biannual release parties warranted coordination to assure the smooth flow of guests and to separate public from non-public spaces. The previous facility mixed production's receiving/truck circulation with visitor autos and pedestrians.

Site planning was organized around a loop circulation to enable smooth delivery and fire protection. One-way traffic minimized the required driveway width, allowing for more landscaping and less impervious surfaces. A loose U-shape frames the central courtyard with expansive views to the west. The courtyard is the primary exterior event space, scaled to accommodate guests during the biannual release parties.

New buildings comprise approximately 68,000 square feet of enclosed space, densely clustered on the compact 3.7-acre site. Due to the area's tendency to flood, the entire site was raised between 3 and 5 feet with a 2:1 slope berm at the perimeter. The elevated building pad also provides an enhanced view from the courtyard and



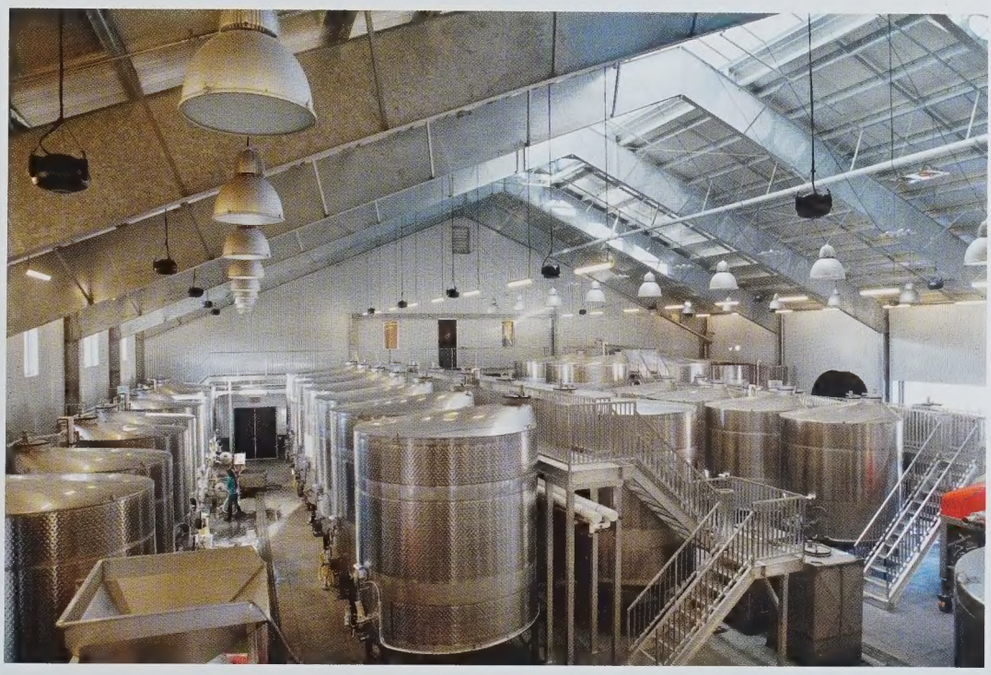
built structures over the surrounding vineyards.

Primary building components include: Hospitality, Administration, Production, and Utility. Although public visitation would be concentrated in only certain designated areas, Silver Oak Cellars directed that there would be "no Back-of-House," meaning no areas of the project would be left aesthetically ignored.

The traditional agricultural vernacular associated with the classic stone wineries of Napa Valley served as inspiration for the design. Primary exterior materials consist of reclaimed stone, stained cedar siding, burgundy-painted aluminum-clad windows, and a zinc-colored metal roof. The new facility references the original pre-flood and pre-fire campus while striking a distinct image for the winery's future.

The **Hospitality Building** is the most visually prominent and centrally located of the structures. Although attached to the Production Building, the structural design is fundamentally different and required isolation from the metal production building. Stone cladding, sometimes on both sides of the wall, called for reinforced CMU (concrete bock) walls. Seismically, this very rigid building needs to move independently of the relatively flexible engineered metal structure of the Production Building.

The more public areas of the Hospitality Building received a traditional post and beam timber frame by Timber Creations. The large tasting



43 stainless steel fermentation tanks allow simultaneous processing in the event that all fruit is delivered and crushed in the same week.

Natural light permitted by the central ridge skylight is supplemented by pendant fixtures suspended from the purlins of the metal roof above and centered on the tank aisles. Sheet drainage at the floor is directed toward a centered grated trench drain.

Below the scissor-truss timber frame roof of the Hospitality Building, 2,825 bottles of assorted sizes stored in the climate-controlled VIW Room represent the entire Silver Oak Cellars *oeuvre* dating back to the first vintage in 1974.

room and bar, large dining area and kitchen, VIW (very important wines) wine library, history room, offices, conference rooms, lab, and winemakers area are all located in this building. Large sliding pocket doors between the dining area and the covered exterior space create a 30-foot-wide portal blurring the distinction between the interior and exterior.

The **Administration Building** is an L-shaped stone and board and batten structure which fits neatly into the northeast corner of the site, framing a manicured vegetable garden in a raised grid of Corten steel planters. The first floor includes wine and miscellaneous storage, an employee exercise room, and employee break area. Offices and conference rooms with views of surrounding vineyards and the Yolo Ridge beyond are on the second floor.

Tucked discretely in the southeast corner of the site, the **Utility Building** combines multiple functions previously scattered across the entire site into one structure. The building

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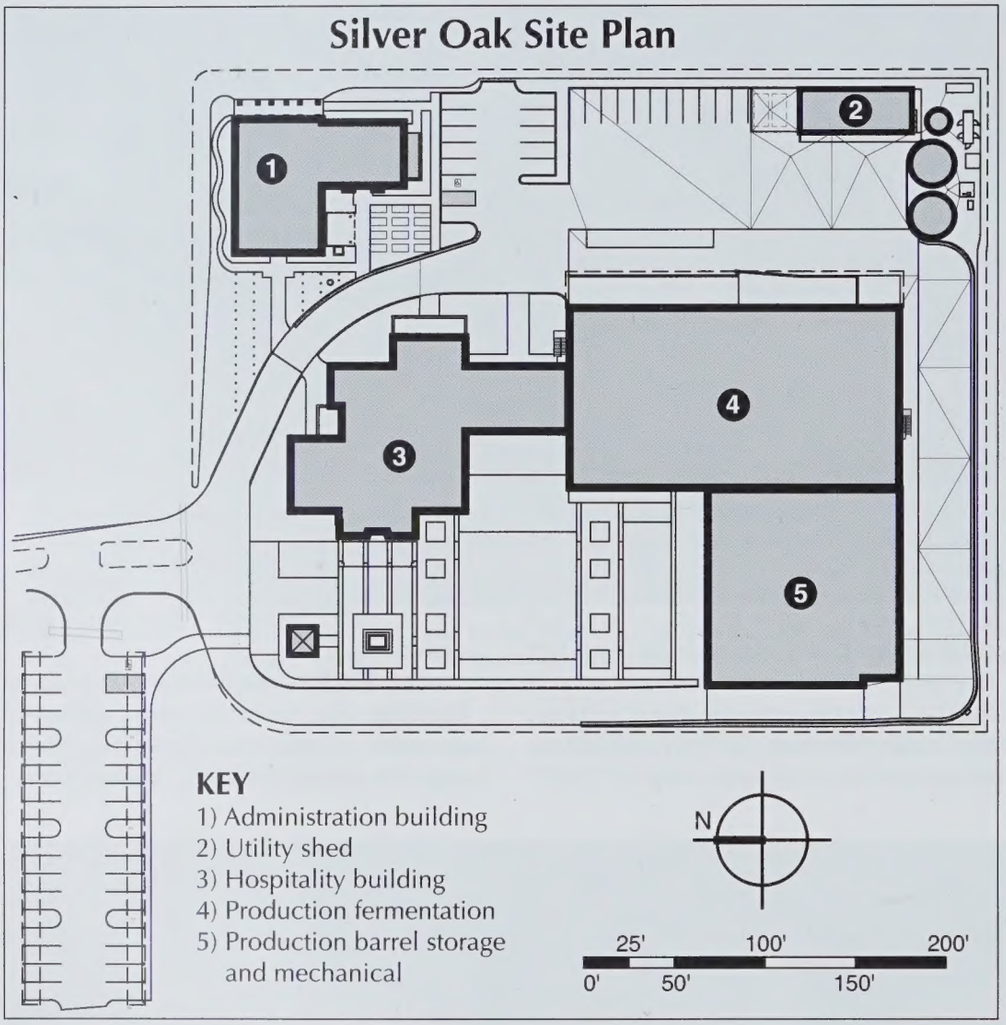
The raised 3.7 acre building site hovers at the same height as the top of the adjacent vineyard. From left to right: Hospitality Building (with iconic water tower in front and obscured Administration Building behind), Fermentation, and Barrel Storage.

encloses the fire protection pump, process waste settling equipment, trash bin enclosure, and domestic water supply filtration equipment.

An adjacent yard includes a propane tank, 10,500-gallon domestic water tank, generator, electrical transformer, and two 46,000-gallon fire protection water tanks. From a facility management perspective, the consolidation of infrastructure components into one central "utility corner" is both convenient and practical.

The **Production Building** is a metal building clad with exterior finishes to resemble a large barn topped by three cupolas. Soule Building Systems sup-



plied a rigid frame structure composed of standard components within a "custom" design. A typical bay maximizes structural efficiency with a minimum number of members enabling a 10,700 square foot room to be unobstructed by interior posts. The rigid frame was delivered on flatbed trucks and erected quickly by crane, reducing costs significantly.

The metal building choice was desirable from a maintenance perspective. The owner accepted the upfront capital expense of coating the metal frame with a galvanized finish. This cost is offset by reduced maintenance, as the galvanized finish is highly effective against corrosion normally associated with high humidity or prolonged exposure to sulfur and other chemicals. Compared to an epoxy paint finish (10-year maintenance cycle), galvanized coatings are reputed to last in excess of 25 years.

The Production Building is illuminated by several alternating rows of 70-watt compact fluorescent domes and linear 32-watt fluorescent T8 lamps, all pedant-mounted at a consistent height above the floor and aligned with the tank aisles. The electrical lighting is augmented by a 10-foot wide x 40-foot long Kalwall ridge skylite which affords ample ambient light without undesired solar gain in a large space without climate control.

Although water resistance and durability were major considerations when choosing interior finishes for the Production Building, the silvery metal finish of the aluminum catwalks and stainless steel tanks are matched by the galvanized rigid frame and light gauge structural members maintaining a consistent palette throughout.

In addition to the galvanized structural members, rigid-insulated metal-lined polyurethane panels are clad with vertical-corrugated Galvalume®-finished metal panels. All perimeter interior walls are lined by a four-foot-high concrete stemwall base, stone-clad on the exterior. The stem wall provides an added measure of durability against errant forklift, scissor lift, and automobile traffic.

Black integral-colored concrete was used in all floors and stem walls. All vertical concrete surfaces are dry-sacked to minimize niches for bacterial refuge and to reinforce the homogenous black patina.

Silver Oak Cellars management does not allow the use of chlorine anywhere

on the campus. In contrast to the warm-colored interiors of the Hospitality and Administration buildings where wood finishes are prevalent, there are effectively no wood surfaces in the Production Building.

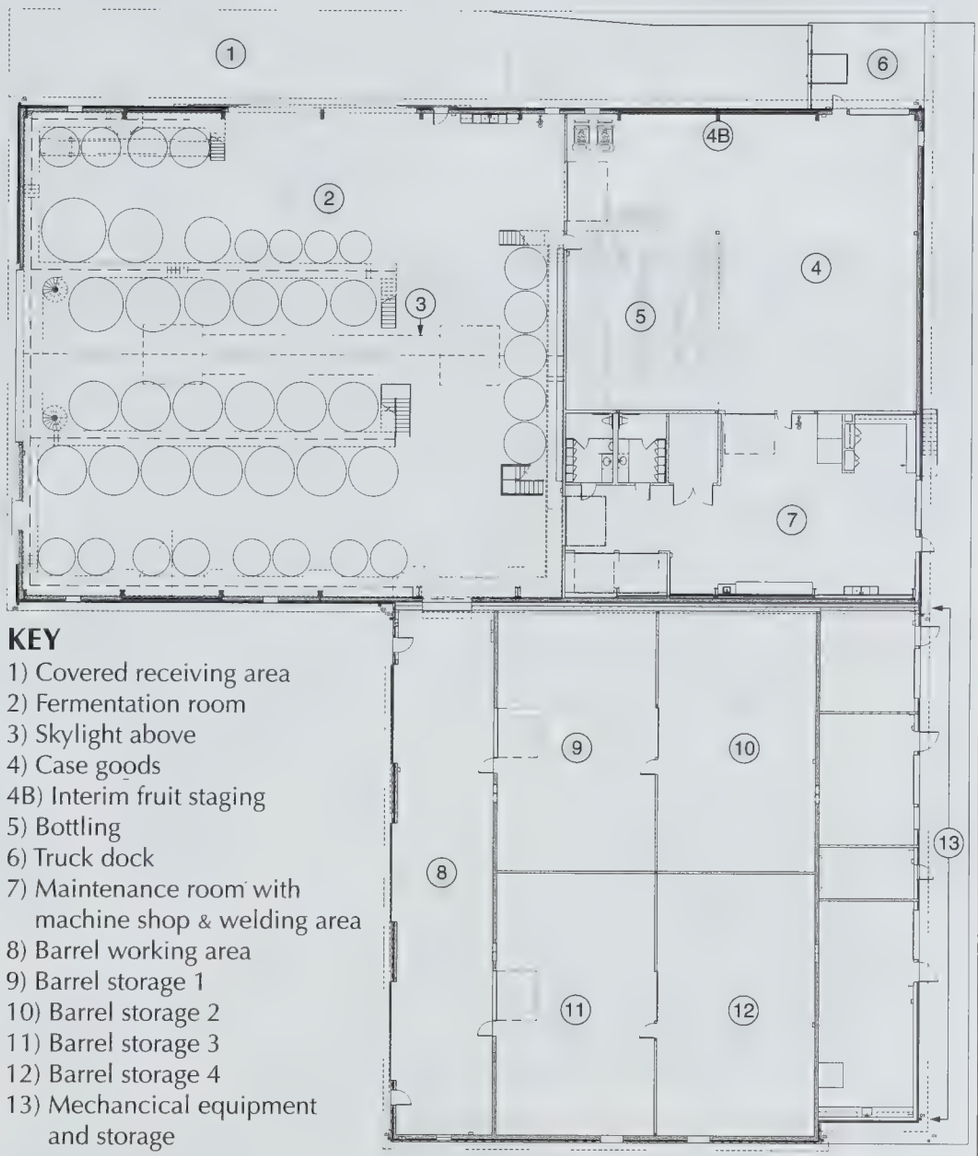
Forty-three stainless steel tanks of various capacities facilitate fermentation and blending of 30,000 cases of wine per vintage. For a traditional Bordeaux blend, Cabernet Sauvignon, Merlot, Cabernet Franc, and Petit Verdot are fermented separately and blended before barreling.

Insulated 4-inch diameter cold glycol and 2½-inch diameter warm glycol lines discretely hang from Unistrut trapezes below the catwalks. Because the tanks vary in diameter, the aisles range in width from 7 feet to 12 feet.

Tony LeBlanc (Chief Operating Officer) remarks, "We installed the Tank Net system for temperature control, and have been very pleased with the functionality. It is very easy to use, and with programmable preset parameters, we can quickly assign tank temperature protocols from a menu of options with specific alarm set-points. With these settings, we are assured that a list of employees will get an email or text message notification if the tank is not within our narrow band of parameters.

"The tanks are set up to automatically switch between heating and cooling modes, so the programs contain both high and low control. Tank Net integrates very well with our wine tracking software, Wine Makers Database (WMDB), and Tank Net provides online monitoring of facility functions for barrel room temperature and humidity, as well as glycol output temperature for chilling units."

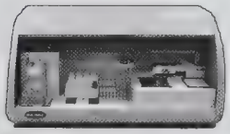
Silver Oak Floor Plan



KEY
1) Covered receiving area
2) Fermentation room
3) Skylight above
4) Case goods
4B) Interim fruit staging
5) Bottling
6) Truck dock
7) Maintenance room with machine shop & welding area
8) Barrel working area
9) Barrel storage 1
10) Barrel storage 2
11) Barrel storage 3
12) Barrel storage 4
13) Mechancical equipment and storage

The **Covered Receiving Area** has a 20-foot deep and 182-foot long canti-

ENZYMATIC TESTS PILING UP?



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levered awning structure without intermediary structural posts. Two 20-foot wide door portals create a flexible production floor. Since completion of construction, the configuration of sorting tables relative to the crushing and destemming equipment has been changed several times in an effort to optimize the assembly line and explore all options before settling on a single layout. This flexibility is allowed by strategically placed electrical and hose stations, ample drainage, and minimal structural obstructions.

The case goods room is directly adjacent to the truck dock for ease of quickly loading vehicles with outgoing bottled wine. This convenient location also facilitates the dual function of the refrigerated case goods room, which serves as interim storage for incoming fruit. As grapes are delivered in MacroBins® to the covered receiving area, forklifts move the MacroBins into the case goods storage room (maintained at 55°F). Chilled MacroBins stack neatly, waiting to be dumped into hoppers in the spill-over crush area of the fermentation room.

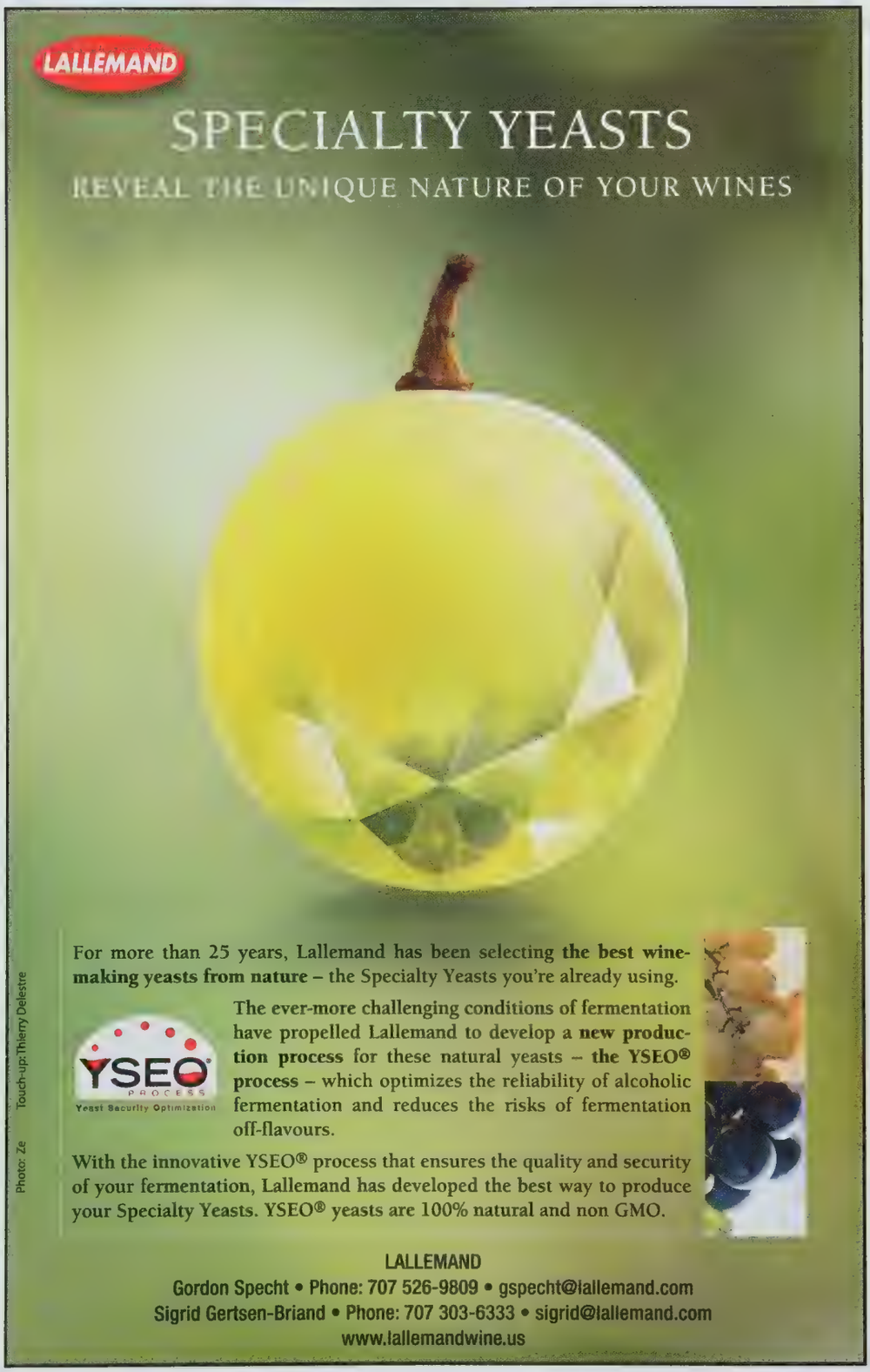
When not in use, all crush equipment is lifted via forklift into the loft storage area, through second-story garage doors. This area went largely unprogrammed during the design process and was deemed bonus storage space as it became clear during construction just how big it actually was. The floors are 1¼" thick epoxy-painted plywood for durability and maintenance. Electrical, refrigeration, and mechanical control panels are relegated to this back room, allowing the prime real estate of fermentation room walls to be kept clear for catwalks and pipe routing.

Because the **Barrel Storage** was conceived as a tilt-up concrete structure, the inherent flexibility and speed of construction afforded by the tilt-up method allowed the contractor the luxury of building other buildings first. As rigid insulation wraps the exterior of the perimeter concrete walls, consistent temperature of the thermal mass of the concrete is maintained and controlled by interior fan coil units.

Barrels are stacked six-high, in a "tight-pack" configuration on movable metal barrel pallets. In this manner, barrel pallets are arranged in a compact layout, which sacrifices access between the pallet aisles for greater density.

Although distinctions such as vineyard-block and harvest serve to determine where certain barrels are stored, all wine stored at the facility is Cabernet Sauvignon. Silver Oak uses new American oak barrels exclusively.

Ample CO_2 exhaust is provided on the perimeter wall bases, and fan coil units are rafter-mounted to maintain a constant 58°F temperature.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Because no racking or barrel working occurs in the barrel storage area, the concrete floor has no drainage or slopes.

A 108-foot long by 20-foot wide space was conceived as a supporting counterpart to the four barrel storage rooms, immediately adjacent. With a single trench drain running down its center, the gentle drainage slopes in the floor allow smooth forklift traffic flow that would otherwise be problematic with multiple area drains.

Towering barrel stacks are systematically deconstructed and spread into an interim single-high array for racking and barrel working. This area is also designed to open up to the courtyard, doubling as a serving area for large hospitality events.

Lining the south side of the Barrel Storage Rooms, a row of rooms form the heart of the facility's infrastructure. Storage, Electrical, Mechanical, and Plumbing Rooms were arranged based on logic of the pipe order, that is supported on stainless steel Unistrut mounted to the north wall. Electrical conduits are routed with glycol, water, and gas lines as they pass through the Mechanical and Plumbing Rooms and continue to Fermentation and Barrel Storage.

Conventional wisdom dictates that electrical conduits may run through "wet" rooms while glycol and water lines are discouraged from passing through spaces with an electrical transformer, distribution board, and photovoltaic support equipment where an inevitable leak would cause otherwise avoidable damage.

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Conclusion

By working in close partnership during the planning phase and maintaining a high level of coordination during the construction phase, winemaker, architect, and general contractor were able to design/ build a winery tailor-made to suit Silver Oak's program requirements. ■

TAYLOR LOMBARDO ARCHITECTS DESIGN TEAM

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Partner: Maurice Lombardo
Project Managers: Beth Bernhardt, Matt Hollis
Project team: Pam Lao, Shannon Slattery, Odessa Schneider
Contractor: Cello & Maudru Construction
Consulting Design Architect: Michael Folwell
Interiors: Martha Angus Inc.
Structural: Hohbach-Lewin
Mechanical, Plumbing, Refrigeration: The Engineering Partnership
Electrical Engineer: Ray E. Slaughter & Associates
Lighting: H. E. Banks
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CARBON FOOTPRINTS of vineyard operations

BY Eli Carlisle, Dept. of Plant Sciences,
David R. Smart,
Dept. of Viticulture & Enology,
UC Davis
Joe Browde, California Sustainable Winegrowing Alliance
Andrew Arnold, SureHarvest

Like many other agricultural and business sectors, the California grape and wine community is increasingly interested in better understanding its "carbon footprint."

A carbon footprint can be defined as a comprehensive measure of the amount of greenhouse gases (GHGs) produced and consumed, and is used to determine whether or not individual operations are contributing to the increase of GHGs in the atmosphere and therefore global climatic change.

Some vineyard operations, such as tractor driving, "produce" GHG carbon dioxide (CO_2). The key agricultural sources of atmospheric CO_2 are the combustion of fossil fuels and soil management practices that increase decomposition of soil organic matter.

Grape growing, however, also "consumes" CO_2 through photosynthesis. For this reason and others, agriculture, including grape growing, is a significantly smaller source of CO_2 than transportation and other industries. However, assessing a carbon footprint for an individual vineyard is somewhat more complex.

Agricultural activities emit two additional GHGs — nitrous oxide (N_2O) and methane (CH_4). The main GHG produced by viticulture is likely N_2O. It is generally believed that the CH_4 footprint in vineyards is insignificant.

The importance of N_2O comes from its strong ability to act as a GHG. N_2O is roughly 300 times more effective than CO_2 at trapping heat in the Earth's atmosphere, so a small amount of N_2O can cause as much global warming as a very large amount of CO_2.

Non-CO_2 emissions

To calculate a carbon footprint, according to the protocol outlined by the International Panel on Climate Change (IPCC), requires the assessment of all GHGs combined into a cumulative, representative number, where non-CO_2 emissions such as CH_4 and N_2O are converted to CO_2 equivalents. For example, this is done for N_2O by multiplying the amount of emissions by its global warming potential (how much better it is at trapping heat than CO_2,). One kg of N_2O = 300 kg CO_2.

Carbon Sequestration

Besides being a source of GHGs, agricultural systems can help offset emissions by the long-term storage of carbon in vegetative structures and soils. This process is referred to as carbon sequestration, and, according to some models, perennial crops like vineyards and orchards are expected to sequester more carbon than annual crops.

Vineyard establishment and management practices can differentially influence the amounts and relative proportions of vineyard GHG emissions and carbon sequestration and, thus, can be adapted to reduce emissions and increase carbon storage to achieve a more desirable balance.

Vineyard Practices and Carbon Footprints

The relationship between vineyard management practices and carbon footprints is reviewed below. For some practices, GHG and carbon sequestration calculation tools can be used to indicate how farming practices influence the vineyard carbon footprint.

On the Ramal Vineyard Estate at Buena Vista Carneros Winery (Sonoma, CA), tillage is done in alternate tractor rows. In November, cultivated tractor rows are seeded with selected cover crops to enhance soil building, increase organic matter, and host beneficial insects. Alternate rows that are not cultivated are mowed twice during the growing season.

Strip spray, under the vines, is applied with soft herbicides, to minimize the application of pre-emergent sprays. Non-chemical alternatives are being considered to remove weeds from under the vines mechanically. Weed control also involves using ancient hoeing/shoveling technique as an alternate. (Photo © Erik Almas)

The U.S. Department of Agriculture Voluntary Reporting Carbon Management Tool, (COMET-VR), shows the carbon equivalent emissions saved from reducing or eliminating tillage in annual crops (http://www.comet vr.colostate.edu/).

Another useful tool is the International Wine Industry Greenhouse Gas Protocol and Accounting Tool (http://www.wineinstitute.org/ghg protocol), developed by Wine Institute and international partner organizations, which allows the calculation of estimated vineyard and winery GHG emissions.

Because these tools are in development, and impacts of site-specific factors such as soil type, climate, rootstock, grape variety, and vineyard age on GHG emissions are not fully understood, it currently is not possible to definitively evaluate the emissions for every management practice.

However, use of the tools provides understanding about how carbon accounting works. Nevertheless, a number of vineyard activities clearly affect GHG emissions, for which current understandings and mitigation tactics are described below.

Fossil Fuel Combustion

Combustion of fossil fuels during the operation of tractors, ATVs, irrigation pumps, and other farm equipment often constitutes a large source of the vineyard GHG footprint. Different fossil fuels are associated with different amounts of GHGs.

However, all fossil fuels, including cleaner-burning natural gas, combust to produce significant amounts of CO_2 and variable quantities of other GHGs like N_2O.

Although it has a greater energy content per unit volume, diesel produces more CO_2 and N_2O than gasoline, natural gas, or propane. Reducing fuel usage is one of the most obvious and effective ways to reduce the vineyard GHG footprint. Any reduction in tractor passes, for example, diminishes the carbon footprint.

Nitrogen Fertilizer applications

Another important source of vineyard GHG emissions is the use of nitrogen fertilizers. When any nitrogen is added to soil, some of the applied nitrogen can be converted to N_2O. This can happen to any nitrogen-containing additive including synthetic fertilizers (nitrate and ammonium) and organic materials (green manures and pomace).

All N_2O production associated with vineyards results from soil microbes using the nitrogen instead of the vines. Moreover, some added nitrogen can leach into groundwater and subsequently be converted to N_2O. Minimizing N_2O emissions may be challenging.

For example, in winegrapes where little fertilizer generally is used, it may be difficult to further decrease emissions of N_2O. Use of organic fertilizers and cover

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crops instead of synthetic fertilizers to supply necessary nitrogen may limit emissions but has not been proven.

Timing nitrogen applications to ensure maximum uptake by roots may decrease N_2O emissions and nitrogen leaching, but more research is needed.

Irrigation

Vineyard water use can impact GHG emissions and carbon sequestration. The energy used during irrigation to pump water results in GHG emissions. Moreover, a correlation exists between increased irrigation and GHG emissions from soil. At high moisture content, soils have minimal oxygen content and microbes produce more N_2O.

Anaerobic soils are optimal environments for microbial production of N_2O (and CH_4, though less important for vineyards). Wet soils, especially when warm, can also increase CO_2 emissions through increased microbial activity and decomposition of organic matter.

In contrast, increasing irrigation can offset some GHG emissions by stimulating vines to grow and store carbon in permanent structures. This is a form of above-ground carbon sequestration that is especially effective if vines live for many years and much of the removed vine biomass is incorporated into the soil to increase organic matter.

Various irrigation systems and patterns may differently impact GHG emissions from soils. Drip irrigation is thought to produce less N_2O than flood or furrow irrigation at the vineyard level but more research is needed.

Tillage

The act of tilling soil consumes substantial quantities of fossil fuel. Estimates of fuel usage during tillage operations and potential savings from alternative management strategies can be determined using a general calculator at: http://ecat.sc.egov.usda.gov/. (Use the estimated acreage of a wheat

GHG estimates from combustion of fossil fuels

- Diesel produces 12 kg CO_2 equivalents (CO_2 + N_2O + CH_4)/gallon
- Gasoline produces 10.5 kg CO_2 equivalents/gallon
- Propane produces 8.5 kg CO_2 equivalents/gallon
- Natural gas produces 1.5 kg CO_2 equivalents/meter^3

Comparative GHG impact from vineyard nitrogen management practices

Synthetic Fertilizers (CAN, UAN, ammonium nitrate, other nitrate fertilizers, etc.)

- GHG released during manufacturing (also applies to pesticides)
- Small percentage directly lost as N_2O on-site (currently thought to be about 1%)
- Small percentage indirectly lost off-site through leaching/volatilization to NH_3 followed by conversion to N_2O (currently thought to be roughly 0.3%)
- Potentially higher rate of leaching than organic fertilizers

Organic Fertilizers and Additives (green manure, compost, winery wastes, etc.)

- Small percentage lost directly as N_2O on-site
- Small percentage indirectly lost off-site through leaching/volatilization to NH_3 followed by possible conversion to N_2O
- Potentially lower leaching rate than synthetic fertilizers
- Higher rate of volatilization than synthetic fertilizers, in some cases
- More GHG produced by fuel use during tractor operations to apply manures than by fuel use during fertigation
- Effective way to sustainably reduce synthetic fertilizer inputs and recycle winery waste
- Good way to build soil organic matter and thus increase carbon sequestration
- GHG cost of compost and manure transport can be high unless generated on-site

Legume Cover Crops

- Small, but unknown percentage probably lost directly as N_2O
- Can decrease between-row leaching rate and better retain nitrogen in soil
- Good way to build soil organic matter and thus increase carbon sequestration
- Not the most efficient way to provide nitrogen to vines

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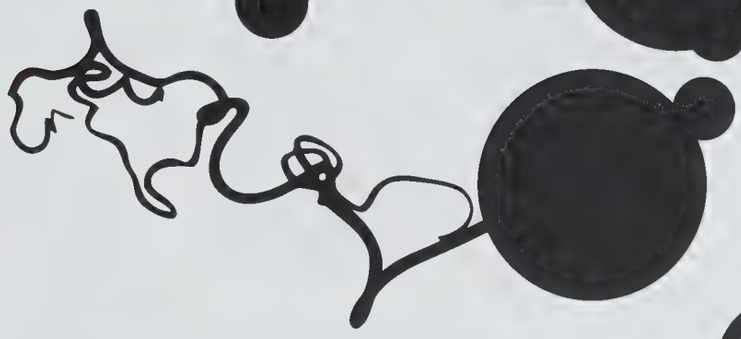

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cover crop.) The Wine Industry GHG calculator (http://www.wineinstitute.org/ghgprotocol) also performs this function.

By breaking up soil aggregates, tillage increases soil emissions of CO_2 and possibly N_2O by mobilizing carbon and nitrogen, thus allowing microbes to access and consume previously protected organic matter. Each tillage pass causes some loss of soil-sequestered carbon as CO_2.

Decreased tillage not only limits CO_2 emissions but minimizes losses of organic matter through erosion. While building up soil organic matter may lead to some additional CO_2 and N_2O production, the net balance will be greater soil carbon storage in the long term. Additional research is needed to clarify these impacts in California.

Cover Crop management

The use of cover crops can increase the storage of carbon in vineyard soils and decrease CO_2 emissions. Perennial cover crops are most efficient at doing this because of their large root production. In addition to increasing soil carbon, leguminous cover crops supply nitrogen to the soil, and may be used to decrease applications of synthetic fertilizers.

Cover crops also decrease the offsite movement and loss of soil organic matter by erosion and nitrogen by leaching. The relationship between cover crops and GHG production and carbon storage is an area of ongoing research.

Vineyard Pruning and Thinning

Vineyard pruning and thinning practices may increase soil carbon storage if the extracted biomass remains in the vineyard. Similarly, the dropping of fruit can be a valuable carbon input. Removal of dead vines represents a loss of carbon storage unless the vines are chipped and left in the vineyard.

Comparative GHG impact from tractor-row tillage systems

Conventional Tillage (less than 30% of crop residues left on surface after tillage)

- Frequent tillage (more than one or two times per year) releases more CO_2 by exposing newly formed organic matter to microbial decomposition
- Potentially increased loss of organic matter to erosion
- Decreased capacity of soil to store carbon
- Generally less carbon entering soil organic matter compared with other tillage systems
- Possibly greater consumption of fossil fuel for tractor operations, resulting in more GHG emissions

Conservation/Reduced Tillage (more than 30% of crop residues left on soil surface)

- Fewer tillage passes (1 pass per year or even less under certain conditions) releases less CO_2 due to slowed organic matter decomposition
- Decreased loss of organic matter to erosion
- Increased ability of soil to store carbon
- Generally more carbon enters soil organic matter than with conventional tillage
- Often associated with cover cropping which also enhances soil carbon storage
- Possibly less GHG emissions associated with tractor operations

No Tillage (no disturbance of soil surface)

- No GHG emission from tractor tillage operations
- Increased ability of soil to store carbon
- Soil aggregates are not broken up, protecting organic matter from microbial consumption
- Greatest rate of carbon entering soil organic matter from row vegetation
- Cover crops often used, including leguminous plants that supply nitrogen and can lower synthetic nitrogen fertilizer needs
- Depending on site-specific factors, increased soil carbon can sometimes lead to higher emissions of the more potent N_2O, which may counteract some benefit from carbon sequestration

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GHG impact from Irrigation Strategy
- Frequent, low-volume irrigation may produce less N_2O than infrequent, high-volume irrigation
- Drip irrigation likely causes less N_2O emissions than flood or furrow irrigation at the vineyard level, but if nitrogen fertilizers are applied through the drip system, then this could offset this benefit somewhat by concentrating nitrogen in soil, which may increase N_2O production under the drip emitter (this is an area of uncertainty)

GHG impacts of Cover Crops
- Increase soil carbon storage (especially perennial cover crops)
- Increase soil nitrogen levels (legumes) and may decrease need for synthetic fertilizers
- Potential reduction in leaching of nitrogen through the soil
- Potential decrease in indirect losses of N_2O due to decreased leaching rates
- May require tractor-mowing passes which are an additional source of fossil fuel GHG emissions
- May compete with vines for water, possibly resulting in more irrigation and associated GHG emissions from pumping water
- Potentially decreases losses of soil organic matter to erosion, particularly on hillsides

GHG impacts of Pruning/Thinning practices
- Some vine material extracted during pruning and thinning may be incorporated into soil organic matter, increasing carbon sequestration
- Fossil fuel used during mechanical canopy management can contribute substantial amounts of CO_2
- Removal of dead vines is a loss of carbon storage unless chipped and left in the vineyard

GHG impacts of Hedgerows and Native Vegetation
- Native perennial vegetation is a significant source of carbon storage
- Native oak systems store large amounts of carbon in soil and trees
- Decreased potential for erosion and runoff
- Decreased potential for nitrogen and/or pesticide contamination of surface and ground water

Hedgerows and Native Vegetation

Planting hedgerows and conserving or restoring natural vegetation may substantially reduce the vineyard GHG footprint. Carbon stored in these woody long-lived plants can represent a large source of sequestered carbon, significantly decreasing overall GHG emissions.

Oak woodlands, for example, store huge amounts of above- and below-ground carbon over their lifetime. Moreover, hedgerows and native vegetation within the vineyard landscape decrease the collective environmental impact of viticultural activities by decreasing soil erosion and the leaching of fertilizers into surface and ground water.

Summary

Table I shows the relative impact of vineyard practices on the atmospheric GHGs — CO_2, N_2O, and CH_4 — according to scientific understanding. While more research is needed to address knowledge gaps and better understand how practices definitively impact the carbon footprint, Table I can help practitioners identify and consider practices to continually enhance reductions in their vineyard carbon footprint. ■

Table I: Vineyard Impacts on Atmospheric GHGs

Model Components	CO_2 (X)	N_2O (300X)	CH_4 (25X)
Carbon Sequestration	−−−	+/−	+
Tillage	+++	+/−	+/−
Nitrogen Fertilizer	+/−	+++	−
Biomass			
Vine Carbon Storage	−−	?	?
Vine Decomposition	+++	++	+
Soil Amendments			
Compost	−−	++	+
Manure	−−	++	+
Lime	+/−	+/−	?
Cover Cropping	+/−	+/−	+
Irrigation Water	+/−	+++	+
Fuel Use			
Vehicles	+++	++	+
Pumps	+++	++	+
Electrical Grid	+++	++	+

+ = Increase; − = Decrease; ? = Unknown; +/− = Site-Specific

Number of symbols indicates relative magnitude of impact.

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Development of third-party certification

The California Sustainable Winegrowing Alliance (CSWA) is currently developing a third-party certification program related to the California Sustainable Winegrowing Program (SWP). The purpose of the certification program is to increase the sustainability of the California wine industry by promoting the adoption of sustainable practices and ensuring continual improvement.

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The certification pilot phase was February to June 2009. CSWA hopes to launch the certification program in 2009. CSWA is undertaking an external stakeholder outreach effort to ensure transparency and credibility of the proposed certification program.

SWP background

Building on major trends and successful regional efforts, the Wine Institute and the California Association of Winegrape Growers (CAWG) launched the SWP in 2002 to give growers and vintners educational tools to increase adoption of sustainable practices and to measure and demonstrate ongoing improvement. Wine Institute and CAWG formed CSWA in 2003 to help implement the SWP.

The SWP is based on the "Cycle of Continuous Improvement" concept. Participants assess their operations using a comprehensive "Code of Sustainable Winegrowing Practices" workbook, interpret their results using customized reports that benchmark their practices relative to statewide and regional averages, attend targeted education workshops to learn about best practices, develop Action Plans on areas they want to improve, implement change, and reassess, beginning the cycle again.

Nearly 1,500 vintners and growers — representing approximately 60% of the state's wine production and vineyard acreage — have self-assessed their operations in 125 workshops and more than 5,500 have attended 160 targeted education workshops. Statewide Sustainability Reports, beginning with a 2004 Sustainability Report, document results, identify strengths and opportunities for improvement, and set goals to increase the use of sustainable practices. A 2009 Sustainability Report will provide in-depth analysis on the status of the industry relative to the improvement targets that were published in the 2004 Report.

The Sustainability Reports are available online at www.sustainablewinegrowing.org/publications.php. There are only two reports: 2004 and 2006.

Valuable input from a broad range of stakeholders was received during development of the Code. Expertise

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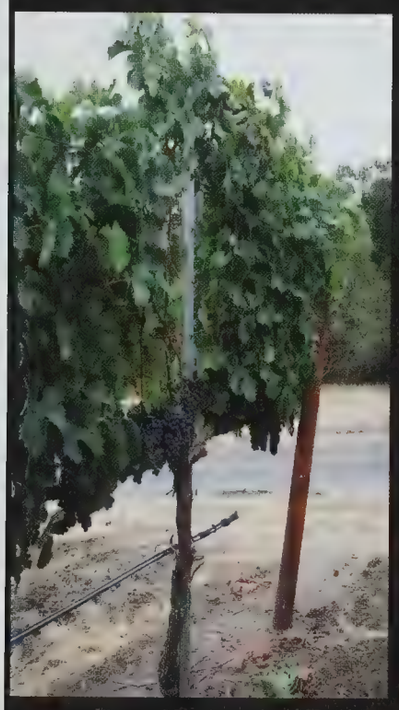

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SWP certification

Given the market and regulatory climate, CSWA has determined that an option for third-party verification of SWP participation is an appropriate next step in the evolution of the program and to maintain the California wine industry's leadership position and commitment to transparency. Certification can serve as a tool to speed adoption of sustainable practices, communicate with stakeholders that are increasingly interested in sustainable business practices, and increase transparency and ensure confidence of progress on these activities.

CSWA's certification program aims to advance the industry as a whole. It is intended to be a catalyst for continual improvement and to support the entrance of members at all stages of the sustainability journey to participate and benefit from the program, while enhancing the credibility of the program through third-party verification.

Because optimal economic, environmental and social performance differs depending on region, product, business size, and other issues, measuring continual improvement to one's own baseline performance is a highly efficient and effective way to advance an industry towards sustainability. Through certification, participants at all levels of achievement would be able to receive third-party verification that priority areas for improvement are being identified through self-assessment and subsequently acted upon.

DRAFT requirements for the proposed process-based verification include:

• Annual Self-Assessment using the Code of Sustainable Winegrowing Practices Workbook and supporting evidence to demonstrate accuracy of category choices (1 to 4) or non-applicability for certain SWP criteria during a regularly scheduled third-party audit.

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• Demonstration of a process for identifying the key sustainability issues for their company, prioritizing areas for improvement, and establishing Action Plans that are implemented and updated annually.
• The ability to demonstrate practices that maintain or improve category choices (1 to 4) for SWP criteria and methods to correct any items identified internally or by an auditor as inconsistent with SWP self-assessment categories.
• Demonstration of continual improvement over time.
• Signed commitment to the Code of SWP, continual improvement, and applicable legal requirements.

Sustainability performance indicators

CSWA is developing a complementary project to identify key sustainability performance indicators for the industry (energy and water efficiency, GHG intensity, etc.) in order to baseline the industry and set targets for improvement. The Stewardship Index for Specialty Crops will inform the final set of metrics that will be used.

The California wine industry has several active representatives involved in this related project. Participants in the certification program will be required to consider industry-wide targets when creating their own Action Plans for continual improvement.

CSWA also intends to develop a competitive sustainability award program to acknowledge leaders in sustainable winegrowing and those that are contributing significantly to improvements on key industry performance metrics. Details of the award program are still being developed.

A certification program in which all California wineries and vineyards may participate — coupled with the publication of progress reports of assessment results and performance-based targets for industry-wide improvement — will uniquely position the state's wine community by credibly demonstrating adoption of sustainable practices, continual improvement, and positive economic, environmental, and social impacts. ■

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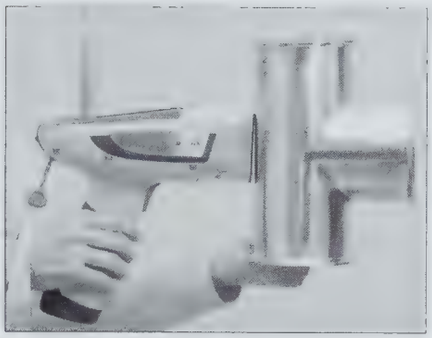

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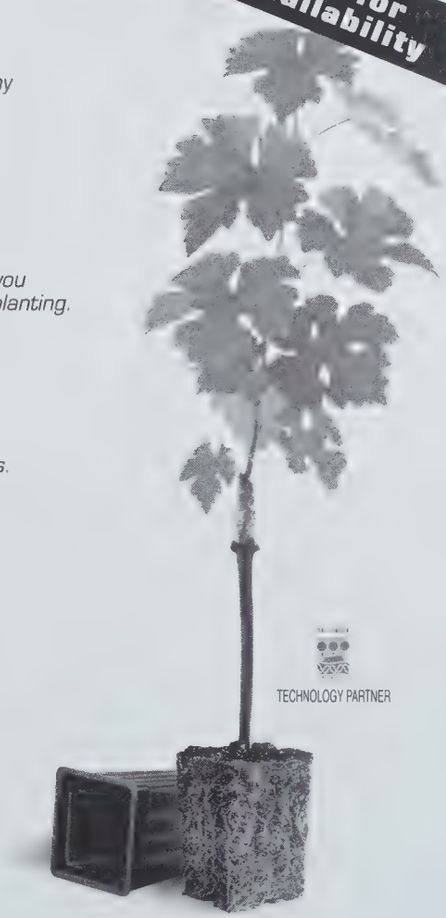

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Grape prices and wine quality

BY Dr. Richard Smart

One of the most difficult questions to answer in the modern wine industry is: "What is the value of these grapes?" We all recognize a variation in wine price in the marketplace, which may be tenfold or more. It seems reasonable to assume that the higher-priced wines are of higher quality, although I recognize that this is complicated by issues of marketing, reputation, and availability.

It also seems reasonable to assume that high-quality wines are made from high-quality grapes. Readers of this column will know my bias in that regard, in that I believe that *wine quality is effectively determined in the vineyard*, and **not** in the winery.

Many grape measurements can be used to predict winegrape quality, and therefore the grapes' suitability for being made into wine. However, probably the best way to assess grape suitability for winemaking is to make the grapes into wine. Some wineries in Australia pay a bonus for grapes after the wine is made and graded within the winery system. This requires that different grape lots are kept separate in winemaking, which can be an expensive process in itself.

While this approach seems commendable, it is hardly an independent assessment of potential wine quality. For this system to work, the grapegrower must have absolute trust in the winery.

Ideally, the assessment of winegrape quality should be made in the vineyard before harvest. This might allow the grower to negotiate price with a winery and allow the winery to allocate resources to give high quality fruit priority treatment. Even more ideal would be to give the grower advice about how quality may be improved in the future by changing vineyard management.

Leaf and fruit exposure are vineyard attributes which are easy to manipulate with trellis method, for example. This is a well-exposed Pinot Noir clone 115 fruit zone in Tasmania, Australia. In hotter climates, this degree of fruit exposure will need to be reduced.

This subject is at the heart of the marketplace for winegrapes. Often winegrapes are sold at a fixed price, which is set for a variety in a region. Some wineries specify minimum sugar content, others specify yield limits. I believe that the latter is based on consideration of wine grape quality, although my previous column (July/August-2009) has indicated my thoughts that yield is generally unimportant in affecting quality.

Perhaps yield limits are more important to wineries for planning and scheduling considerations, although many enologists I meet are misguided in imagining vineyard yield is an important quality attribute.

Determining grape suitability for winemaking

I will describe here two general approaches to determining whether grapes are suitable for winemaking; the first is based on fruit attributes and the second on vine attributes. I will also speak, in general, about vineyard blocks although I recognize that, with modern techniques like aerial infrared imagery, it may be relevant to divide non-uniform blocks into management zones.

1. Measuring fruit attributes

This approach depends on being able to take a representative sample of grapes at some specified period, commonly close to harvest. The fruit may be subject to simple analysis, such as sugar content, titratable acidity, pH, and berry weight. More complex analyses of color, tannins, and even of aroma compounds can also be made.

All but the simplest analyses are expensive to perform, although this situation is changing with the adoption of new analytical techniques based on spectral measurements and correlation. This approach can even be taken into the field, and using reflectance information from the fruit, relevant estimates of berry composition can be made, and these can be GPS-mapped. This is currently an active area of research.

In any event, these approaches can allow for differentiation between different vineyard blocks and an estimation of winegrape quallity for winemaking. I should add that, in my experience, measurement of sugar, titratable acidity, and pH provides only limited information about grape suitability for winemaking, and yet these

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are the common measurements made in the wine sector.

2. Measuring vine attributes

In its simplest form, vineyard attributes — such as clone, rootstock, and yield — can be considered, but in my experience, such measures offer very limited utility to estimate grape suitability for winemaking.

One can also make other measurements of vine attributes within the block, which will have issues of vine sampling as is the case for fruit sampling. This issue aside, there are vine attributes that can be measured and that, in my opinion, are important for wine quality. Some are more important than others, and some are easier to measure than others. I would suggest that measurements of vine balance are useful, as are measurements of canopy microclimate and vine physiological status.

While the measurement of these in a research sense may be complex, time-demanding, and expensive, all of them can be reduced to very simple in-field assessments requiring little or no equipment. For example, canopy microclimate can be assessed visually, using some of the attributes that are presented in my *Sunlight into Wine* scorecard.

Such an approach may seem remote from assessing grapes for wine quality. However, there are good experimental and empirical data supporting the fact that these attributes are very important for wine quality. One advantage of emphasis on vines is that it does lead to suggestions of how the vineyard management might be altered to improve wine quality.

Another advantage is that these measurements may be made earlier in the season, to allow earlier prediction of suitability for winemaking. This can be especially helpful for enologists who want to pre-plan cellar operations for harvest.

Example from Spain

I have been working with a client in Spain over the last several harvests in a program to grade vineyards as to their suitability for winemaking, which, in turn, has led to derivation of grape prices. This system relies on aerial infrared photography and analysis for variability, and vineyard monitoring around veraison.

The program has been very successfully introduced for red winegrapes and is now being extended to white winegrapes. This system has been economical to use and, further, has had great advantage as an educational tool for growers, and a guide to vineyard management to improve grape quality for winemaking.

Conclusion

I see the development of a rigorous system for paying for winegrapes according to quality as some sort of "Holy Grail" for the modern wine sector. If you think about it, most of the everyday items of commerce are much

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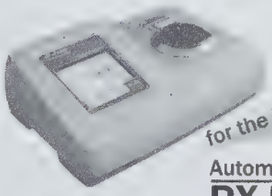

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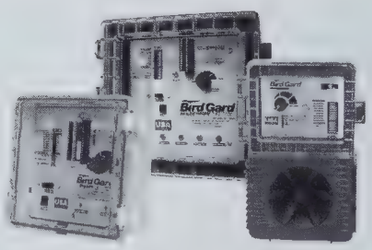

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better specified at point of sale than are wine grapes. Think for instance of the specifications available for electronic items like a mobile phone or a laptop computer, or even grocery items, such as a box of cereal! Such information allows consumers to make value judgments to assist their purchase.

This is not the case for winegrapes. I believe that we have the technologies and information to enable us to move onto the next step in achieving this important goal. It may take several years to develop a totally workable system but that is not to say that we should not start. For example, in Spain we found that the initial system worked well for Cabernet Sauvignon, Merlot, and Syrah but required some adjustment for Tempranillo.

I have no doubt that these systems **will not be the same** for every variety and every region. We can anticipate that the important attributes (both of fruit and vines) will vary with climate zones, variety, and desired wine style. However, surely it is time to move on from the present simple specifications of grape attributes that are now used to buy and sell grapes. ■

Dr. Richard Smart, "the flying vine-doctor," is an international viticultural consultant based in Launceston, Tasmania, in Australia. He can be contacted by e-mail: vinedoc@bigpond.net.au. Read about Dr. Smart's business, including his consulting schedule, educational wine tours, and seminars, at his home page http://www.smartvit.com.au. He visits America frequently and his consulting schedule is arranged by Vinquiry in Windsor, CA, tel: 707/838-6312 and http://www.vinquiry.com.

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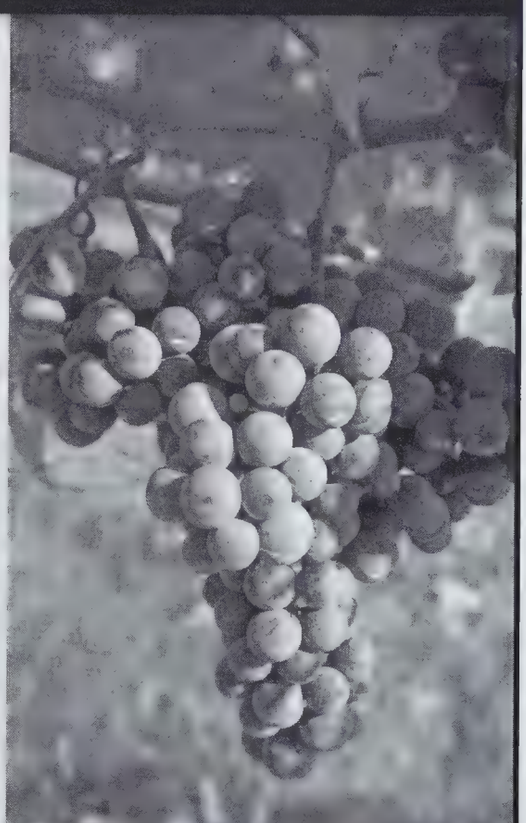

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Water-efficient landscaping at Snoqualmie Winery was one of the first steps in their water-savings program.

SNOQUALMIE WINERY

Saving water in winery operations

BY Tina Vierra

Water conservation is a way of life at Snoqualmie Winery (Prosser, WA) in the vineyards, where the average annual rainfall is only 6 to 8 inches. At the peak of summer, the vineyards receive 17.5 hours of daylight, as much as two hours more per day than northern California.

In 2004, winemaker/general manager Joy Andersen and her team began to explore water savings within the Prosser winery's operations. Snoqualmie houses red fermentation and storage of about 2,000,000 gallons (450 barrels) at Prosser, with the remainder of its barrel storage and all bottling done at nearby Columbia Crest (Paterson, WA).

"Our initial goal was to get below the suggested industry green standard of 2.9 gallons of water for every gallon of wine produced," Andersen reports. (The figure comes from the Wine Institute's Code Of Sustainable Practices workbook, page 10-3).

"Since this facility does not house all the barrels required or do any bottling, we adjusted our target to less than 2.3 gallons," she adds.

Measuring baseline water use

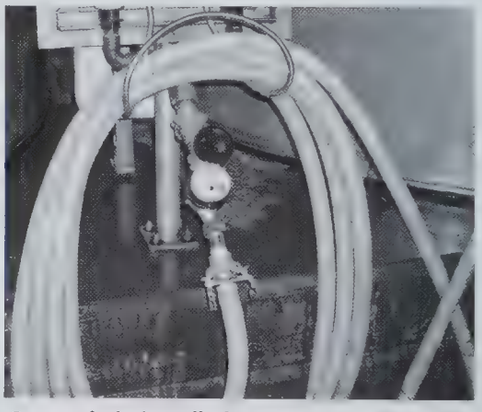
Andersen assigned enologist Meryl Rickey as water manager, and he began by surveying water used and process wastewater generated, gathering data on specific process operations and equipment including tank warming, washing, and rinsing, plus crush/press pad cleaning, racking, filtration, washdown, process water, hose, drain, and tank sanitation, and laboratory water use.

The surveys cover a production year from September to August, with the first year baseline usage measured from September 2004 to August 2005. Where water was not already metered, water meters were installed (www.watermeters.com, $95). Snolqualmie's baseline water use before the project began was 4.37 gallons of water per gallon of wine.

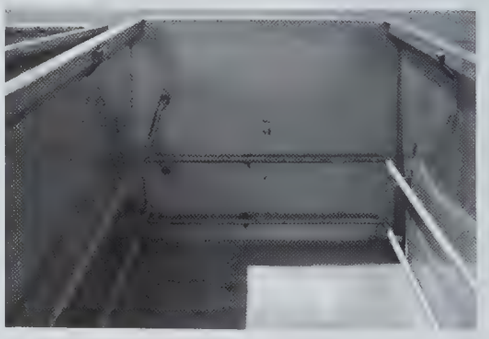
First steps for water savings, 2005–2007

The Snoqualmie team determined options and targeted areas to reduce water use. From 2005 to 2007, the winery implemented reduction measures that required little or no additional resources:

- Increased use of "dry" cleaning methods (using no water),



Snoqualmie installed meters to measure baseline water use at the start of their project, and continue monitoring to achieve their reduction goal.



Piping in open-top 2.5-ton fermentor warms must with glycol instead of water.

Table I: An example from the survey showing water use in the Lab.

	Unit	Count	Gallons	Count	Gallons	Count	Gallons	Count	Gallons	Total Count	Total Gallons	Average	Annual Count	Annual Use
grape samples	sample	90	168	88	212	170	350	76	181	424	911	2.1	5000	10743
dishwashers	load	1	9							1	9	9.0	520	4680
sinks	dozen bottles	3	27							3	27	9.0	1180	10620
condensers	hour	1	60							1	60	60.0	485	29100

- adding restricted flow nozzles on all hoses,
- installing valves and timers on wash and rinse equipment,
- storing operations wastewater in retention pools for natural evaporation,
- planting water-efficient landscaping on winery grounds,
- training employees how to conserve water when performing usual tasks.

Water use went down 3.6% in 2005, 9.0% in 2006. Water use increased very slightly in 2007, but for the three-year period, the winery reduced use to an average 4 gallons of water per gallon of wine. Water cost savings were more than $5,000 per year.

More investment yields more water savings, 2008

In 2008, water savings were increased with new and converted equipment installations. "In 2002, we chose not to install warming jacket capabilities on all fermentors because we were only crushing 4,000 to 5,000 tons per year and they were not a necessity," recalls Andersen. "But as crush capacity increased, it became imperative to increase warming capabilities in order to turn fermentors quickly. From mid-October to early November the fruit often comes in at temperatures below 45°F.

"From 2004 to 2006, we used hot water to warm tanks, either by plate-and-frame heat exchanger, or in some cases, over the outside of the fermentor. In 2007 and 2008, we added glycol tube-in-tube heat exchangers, and glycol heating capabilities to 20 additional fermentor jackets, and substantially

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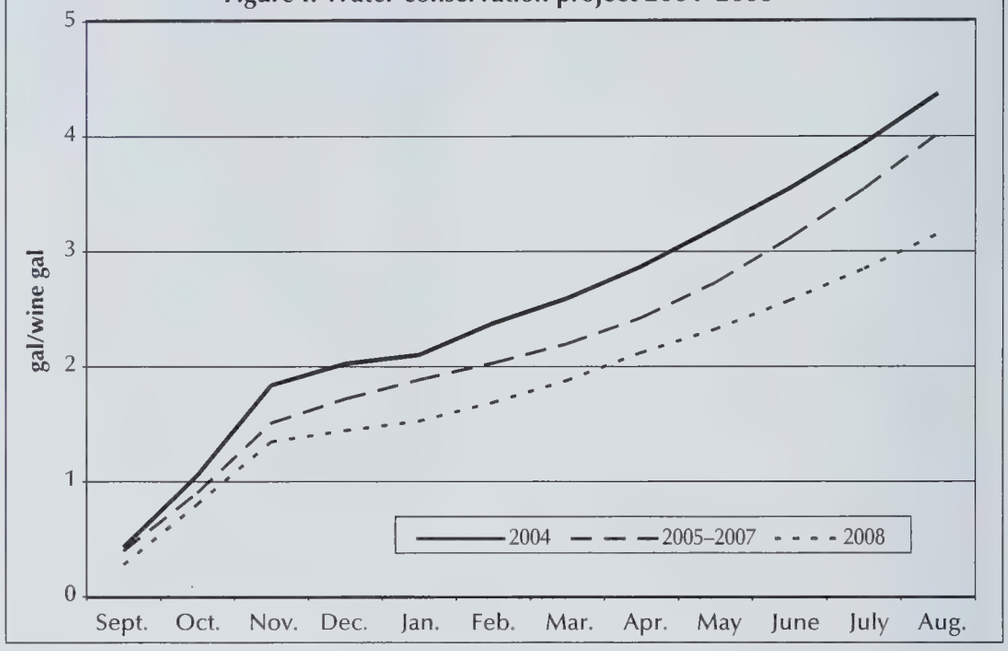
Figure I: Water conservation project 2004–2008



reduced the need for water to warm fermentors."

The cost for the tube-in-tube glycol system was about $11,000, which

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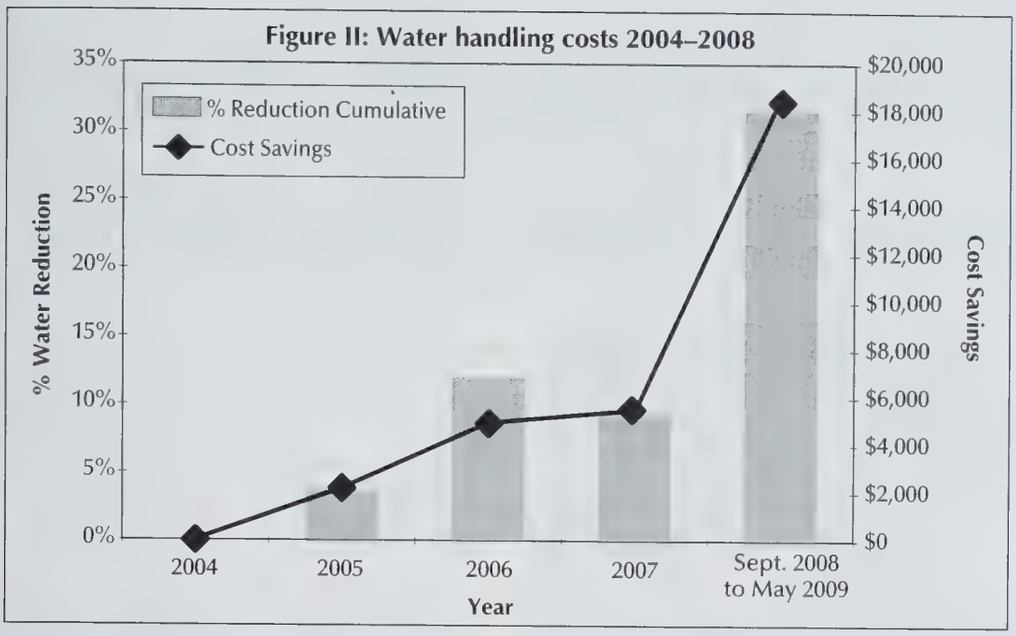

Snoqualmie has already recovered in water cost savings. Cost for the heated fermentor jackets was about $95,000, and estimated payback time with water and energy savings is two years.

Water handling costs decreased with the new procedures (see Figure III), with a 23% water use reduction and over $17,000 in cost savings.

Next steps to achieve water goal, 2009–2011

In 2009, Snoqualmie is pursuing reuse of wash water, and planning to implement recycling of process wastewater in 2010 or 2011. Andersen believes a wastewater recycling/reuse program will become the biggest water-saving measure of all.

Andersen projects water use to be just under 3 gallons of water per gallon of wine by end of the measurement/ vintage year in August 2009, and that the winery will meet its goal of 2.3 gallons by 2011. ■

More information

The Wine Institute's *Comprehensive Guide to Sustainable Management of Winery Water and Associated Energy*, a 316-page guidebook plus worksheets, is available free for wineries at http://www.wineinstitute.org/-winerywaterguide.

BOTTLING O_2

Preventing oxygen ingress through the closure after bottling

BY Richard Gibson,
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Oxygen ingress after bottling causes quality loss in wine. Long-term trials are often carried out to assess the oxygen barrier properties of different wine bottle closures. At the commencement of these trials, bottles are filled with the same wine under the same conditions and sealed using different closures. Analyses are then performed at fixed time intervals after bottling (for example 1, 3, 6, 9, 12 months) to evaluate changes in the wine that are induced by reactions with oxygen, such as loss of sulfur dioxide, loss of ascorbic acid, and generation of brown color.

In these trials, however, it is often difficult to differentiate between the impacts of oxygen that has been included in the bottle at filling (dissolved oxygen in the wine, oxygen included in the bottle headspace gas, and oxygen contained in the closure) and oxygen that enters the bottle through the closure after the bottle has been sealed.

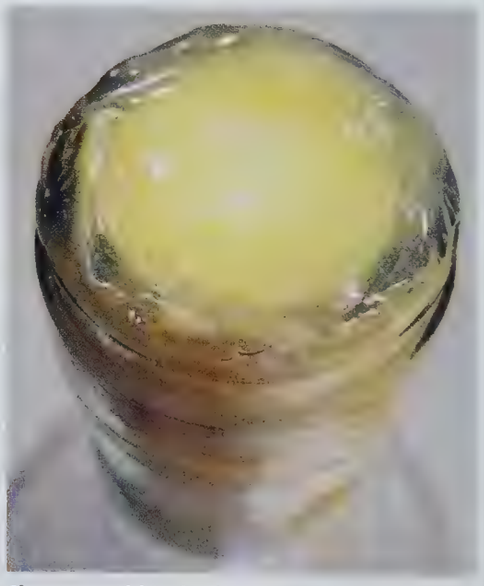
Negative control bottles can be used to assess the relative impact of oxygen included in the bottle at filling and oxygen that enters the bottle through the closure after sealing . These bottles are filled and sealed under identical conditions to the test bottles, but are treated after sealing to prevent oxygen entry through the closure. Testing of negative controls should be carried out at each time-interval throughout the trial. The wine in these bottles will only be affected by oxygen included in the bottle at filling.

In the past, a number of techniques have been used to prevent oxygen entry through inserted closures (corks or synthetic closures) during long-term trials. The Australian Wine Research Institute covered the tops of inserted closures with epoxy glue soon after bottling (AWRI Annual Report 2001). The Chambre d'Agriculture de Gironde covered the tops of closures with wax

Closure inserted into the bottle neck

Gas flame applied to the watch glass

Watch glass applied to the bottle rim



Closure and bottle rim covered with epoxy glue

in a closure study reported in 2004 (C. Chassagnou, pers.comm.). E. Waters and P. Williams (1997) used bottles with a screw cap neck finish. After insertion of the closure, high-barrier screw caps were applied to bottles selected as negative controls.

An easily applied seal that provides an effective barrier to oxygen transfer through inserted closures has recently been developed. The technique uses epoxy glue and standard 50 mm diameter laboratory watch glasses. The following steps are used:

Wine is filled into bottles using normal commercial techniques.

Closures are inserted so that the top of the closure is 1–2 mm below the bottle rim.

The tops of the neck rims of bottles selected as negative controls are lightly abraded with sandpaper to ensure that they are clean and slightly roughened.

Two-pack epoxy glue with a thick consistency (such as Araldite™ or Epiglue™) is mixed and placed on top of each closure, and on the rim of each bottle.

A 50 mm watch glass is then placed over the neck of each bottle. The watch glass is placed so that its convex (domed) surface is toward the bottle rim.

The watch glass is pressed down onto the bottle rim. Glue movement is observed through the watch glass to ensure that there is a complete glue seal between the bottle neck and the watch glass.

The bottles are left upright until the epoxy glue has cured.

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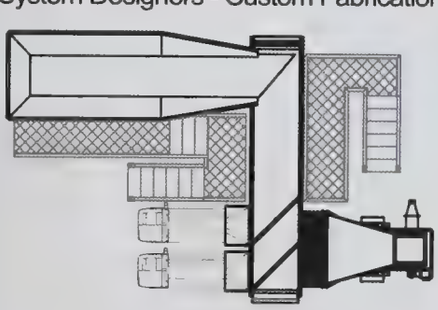

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When analysis of wine in the negative control bottles will be performed, heat is applied to the upper surface of the watch glass using a gas flame or hot air gun until the epoxy glue softens. The watch glass can then be removed from the bottle.

A corkscrew can then be used to remove the closure in the conventional manner.

This technique can also be used to provide negative controls during oxygen transfer rate testing of inserted closures using luminescence systems such as PreSens and Oxysense. The use of secure negative controls ensures that clear differentiation can be made between oxygen already in the bottle at filling, and oxygen that enters the bottle through the closure after sealing has been completed. ■

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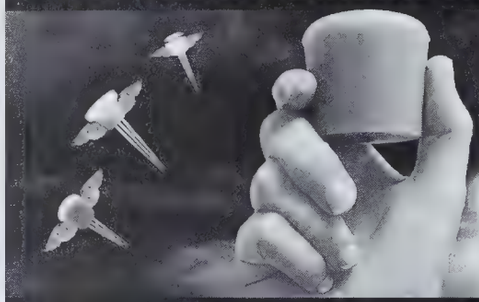
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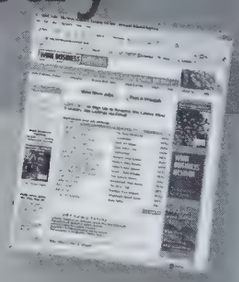
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IMPACT of oxygen level in wine at bottling

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Oxygen plays a crucial role in enology, and in the wine. Louis Pasteur noted that oxygen can make or break a wine. Oxygen management in wine thus represents a key component to maximize wine quality in relation to different markets and types of consumers.

Oxygen can dissolve in wine at several stages during winemaking, bottling and ageing. From a chemical perspective, its presence could result in wine oxidation, and thus change the quality and the extent of a wine's life. Whereas extensive oxygen exposure might be the cause of serious defects, slight to moderate oxidation might benefit a wide range of wines, particularly reds. Carefully managing oxygen is a critical control factor during wine production.

The final step in winemaking — the bottling process — has a significant impact on the content of dissolved oxygen in wine.

Compared to other enological processes, the increase of oxygen before, during, and after bottling is relatively low. However, it is a very important stage because after sealing the bottle, a winemaker's influence on the physically or chemically-dissolved oxygen in a wine is minimal. Therefore, the winemaker has to consider and define how he or she wants a wine to develop during storage before the actual moment of bottling.

IMPACT ON OXYGEN CONTENT IN WINE PRIOR TO BOTTLING — Oxygen transfer into a wine may vary, depending on wine composition. In Figure I, oxygen uptake changes depending on different enological treatments prior to bottling.

The first input of oxygen in the bottling process can occur when unloading wine from a tanker truck, and consequently during blending, fining, cooling, filtration, and immediately before bottling by pumping wine into the filler.

IMPACT ON OXYGEN CONTENT IN WINES WITH DIFFERENT FILLING SYSTEMS/PROCEDURES — Ideally, the bottling process should flow smoothly with a simple and economical system in order to microbiologically protect the wine and to conserve wine quality and its sensory characteristics.

In addition to temperature, bottling pressure is a concern that occurs when inserting a stopper into a bottle. If you do not use a vacuum pump or insert CO_2 into the headspace to reduce oxygen content, oxygen uptake will likely increase during bottling. Other elements influencing oxygen uptake during bottling are time and compounds in the wine itself (enzymes, katalytes [Cu or Fe] and redox system).

RELEVANCE TO COMMERCIAL WINEMAKER? Generally the evolution of gases can be described by Boyle's-Law "P x V = const." During bottling, there are several gases (O_2, N_2, CO_2) in the headspace of the bottle and in the wine itself. Interactions

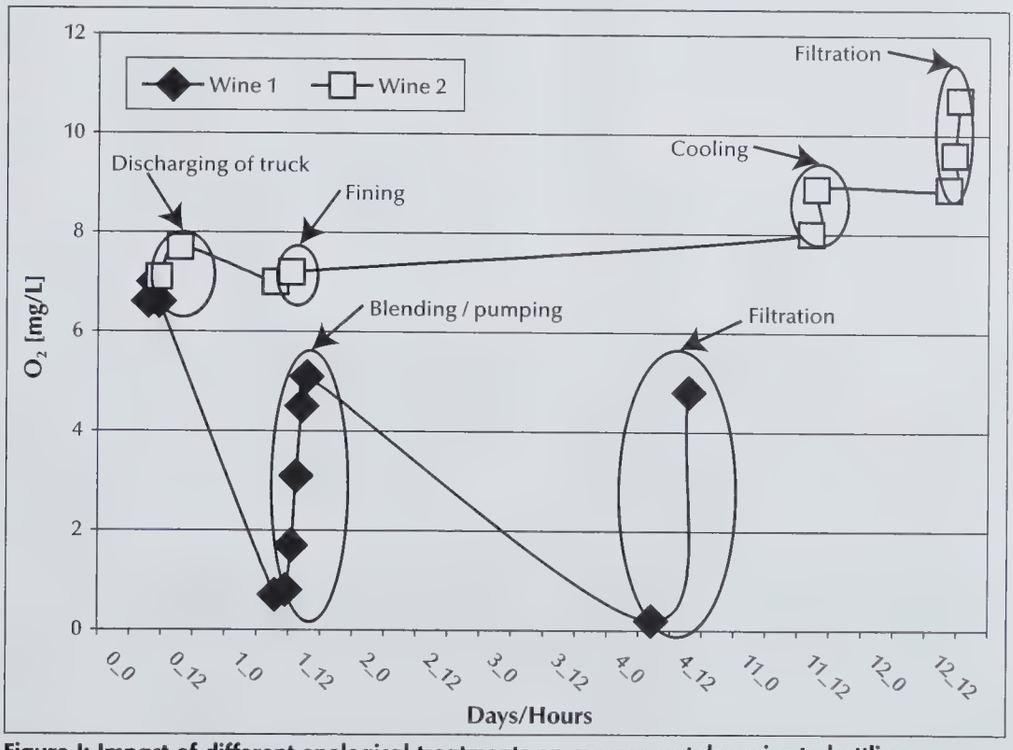

Figure I: Impact of different enological treatments on oxygen uptake prior to bottling. [Deutsch, 1980]

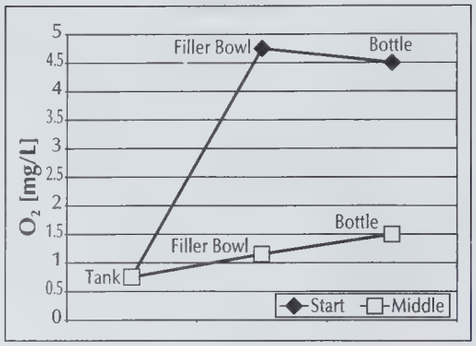

Figure II: Oxygen in wine at different stages of bottling process. [Friedel, 2007]

between these gases and the liquid in the bottle can be influenced by using different filling systems or procedures.

Physical laws, wine chemical compounds, in addition to different solubilities, densities, and diffusions between the gases in the headspace and liquid phase are essential parameters that will influence the oxygen content of the bottled wine. The key decision for the winemaker will be whether to give the wine a longer or shorter "potential lifespan."

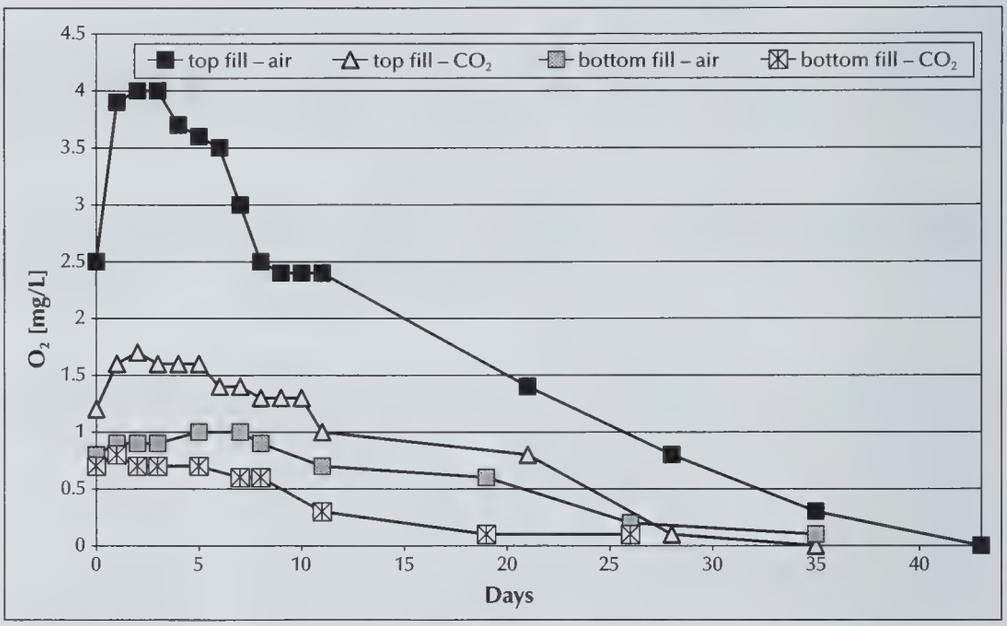

Figure III: Oxygen in wine using different filling systems. [Mc Lellan, 1990]

Oxygen uptake can also be influenced depending on the filler-system and design of the filling valves or use of air evacuation in the bottle before filling. This has been proven and the effects can be observed in the wine shortly after bottling.

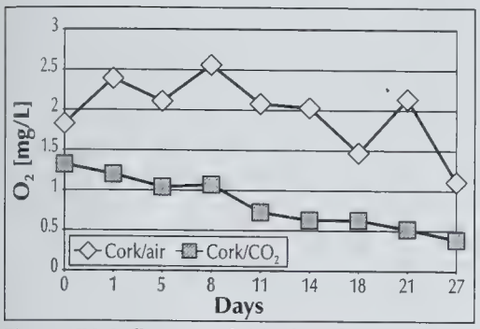

Figure IV: Influence of CO_2 headspace treatment on O_2 content in wine.

Figures II and III show the impact of the oxygen content in wine determined by the stage of bottling process (Figure II) and the use of different filling systems (Figure III).

TEMPERATURE — One of the most important parameters on the solubility of oxygen in wine is temperature. When using different filling procedures, different temperatures of the wine in the bottling process are given.

Generally, filling procedures describe the way and methods that are used to bring a sterile product into the bottle. This can be done by filtration of the wine or also by a pasteurization or warming of the alcoholic beverage. Common filling procedures are: cold aseptic with filtration or flash pasteurization before bottling, warm aseptic with or without recooling, or cold with pasteurization after bottling. Use of the three different techniques will influence the solubility of oxygen in the wine because of the different temperature occurring but also the enzymatical system which enables or disables oxidation also.

EFFECT OF HEADSPACE VOLUME AND TREATMENT ON OXYGEN CONTENT IN WINE — By using different closures, the headspace volume in the bottle can be influenced significantly. The influence of oxygen in the headspace can be measured in the wine during the first storage period after bottling.

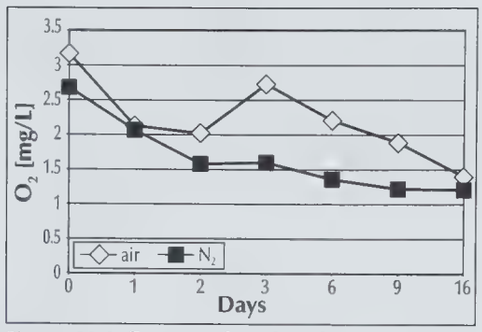

Figure V: Influence of N_2 headspace treatment on O_2 content in wine.

The first storage period is the time that is needed for the wine to consume all the oxygen coming from the headspace. This length of time is determined by the content of oxygen in the headspace, the pressure, temperature, and wine components. From past Geisenheim bottling experiments, our experience is that this can last from 10 days up to three to four months.

Using an inert gas in the headspace of the bottle between the fill-level of

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the wine and the closure greatly reduces the quantity of oxygen which can be dissolved in a wine.

Figures IV and V demonstrate the influence of CO_2 and N_2 headspace treatments on the oxygen content in wine.

In Figure IV and V, the reducing effect of a headspace treatment is very evident. It is interesting to note that by not flushing the headspace with an inert gas, the oxygen content in wine increases within days after bottling. This results from oxygen in the headspace being transferred continuously into the liquid by diffusion between the gaseous headspace and the wine.

Summary

Generally a good knowledge of the composition of the wine (O_2, CO_2, SO_2, acetaldehyde, phenol-content) prior to bottling is necessary to determine the optimal preparation and bottling process for a specific wine.

The input of oxygen into wine prior, during, and after the bottling process is determined by physical constraints and chemical composition of a wine. It can be influenced by using different filling systems and procedures and, more significantly, by using inert gases to flush the headspace in the bottle and evacuating bottles prior to filling.

For the past 15 years, the Department of Enology and Wine Technology at the Geisenheim Research Center, has conducted various bottling trials in order to evaluate alternative bottle closures. Thanks to this research, we have been able to observe the effects on oxygen transfer into the wine described in this article.

For current projects dealing with the measurement of oxygen transfer before and during bottling, we use the non-invasive and non-destructive "PreSens" fiber optic oxygen measurement. Moreover, we are examining, after bottling, development of dissolved oxygen and sulphur dioxide in wines during storage and maturation. The chemical and sensorial changes in wine aromas are also analyzed and correlated with different bottling options and storage conditions. ■

Variations in pre-bottling stages and a better understanding of physical aspects of oxygen in wine and its influence will be the focus of future research of the cooperative trials coordinated by the "O_2inWines" program.

The authors thank Alison Crary, Sterling Winery, Napa Valley, CA for helpful review of this text. This text is edited from a June 2008 O2inWines Conference (Montpellier, France). O2inWines™, an international nonprofit association, created by industrial and academic leaders in the wine industry, promotes scientifically-based solutions for oxygen management challenges in wine. For more information, visit www.O2inWines.org.

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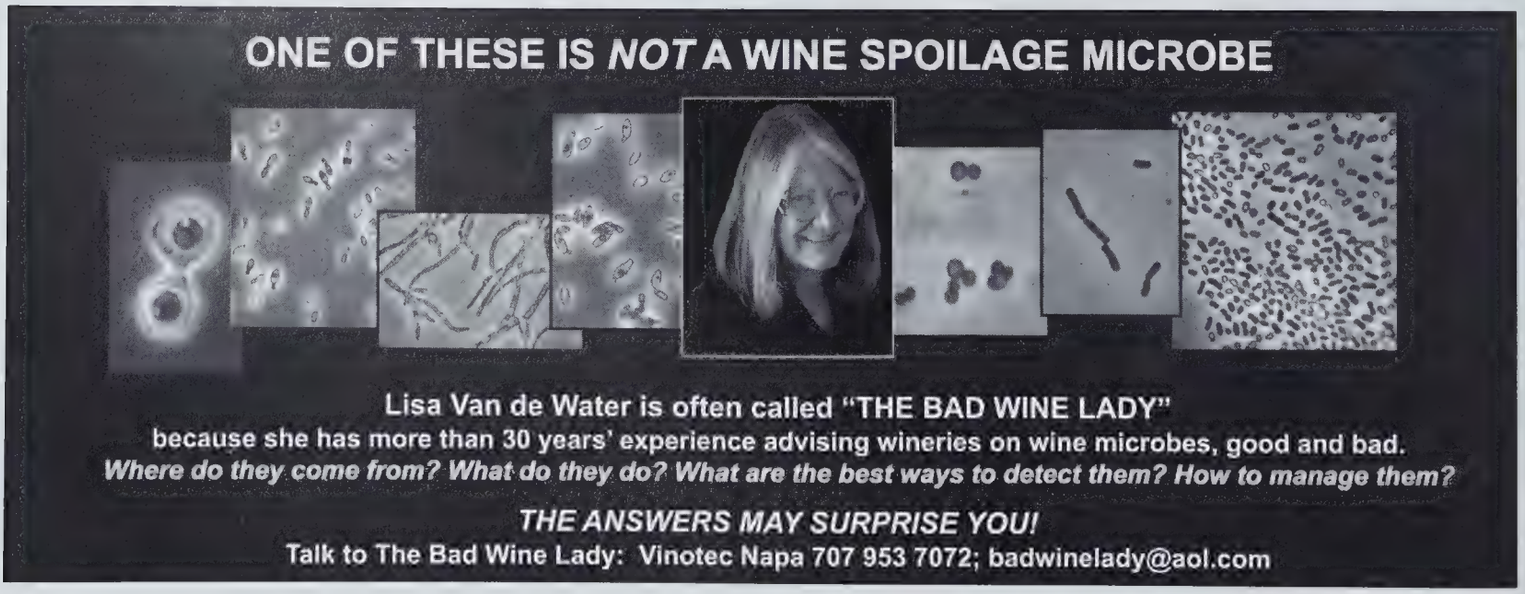
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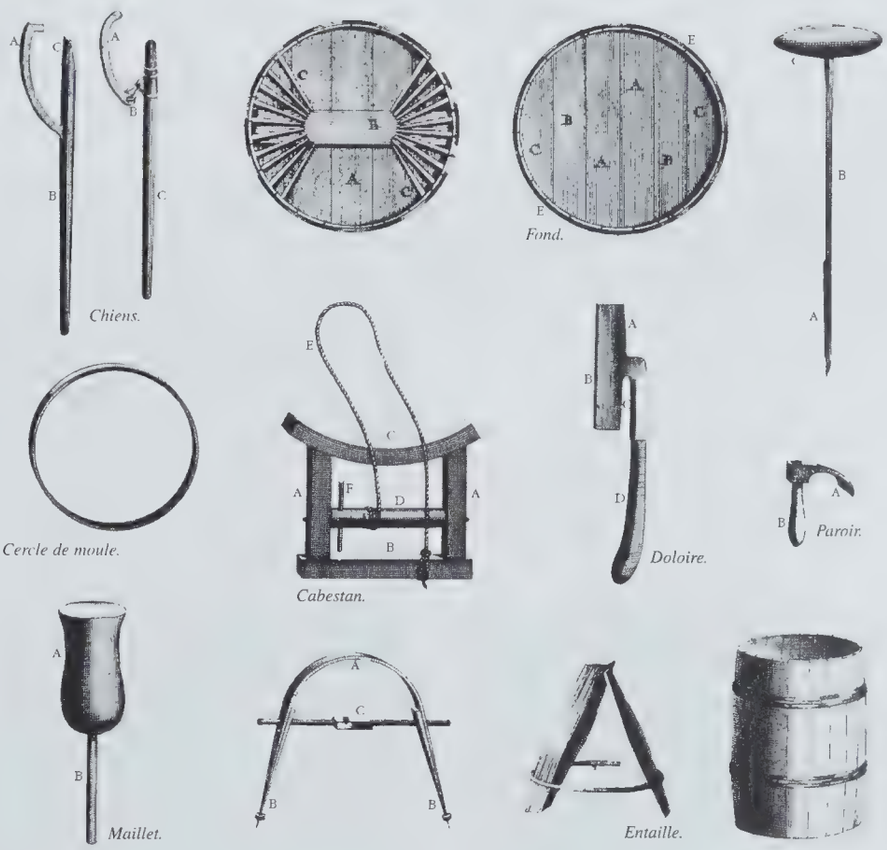

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Monitoring microbes during fermentation

BY Lisa Van de Water

Winemaking involves encouraging cooperation with microbes we want, and discouraging participation from microbes we do not want at all, or do not want at the time (for example, *Saccharomyces* in a bottled sweet wine). Levels of concern vary from wine to wine and from winery to winery, but there are some guidelines to start from.

Monitoring microbes effectively and efficiently during the winemaking process requires coordinating several different techniques. Examination with a phase-contrast microscope, culturing on various media, testing using polymerase chain reaction (PCR) including quantitative PCR and Scorpions™ genetic chemical tests, sensory cues, and other methods all have a place in today's wine microbe detection protocol.

Especially during the harvest season, access to a good phase-contrast microscope is an extremely valuable tool, because samples can be examined directly without staining. Many problems can be detected in a few minutes, so winemakers can respond immediately. A brightfield microscope can be used to examine yeasts after staining, but not to detect wine bacteria. Despite the cost (several thousand dollars), a high-level phase-contrast microscope is recommended for all wineries.

Even with such a microscope, the lower limit of detection by direct microscopic exam is around 2,000 cells/ml. Fortunately for the wine microbiologist, however, microbes involved in spoiling fermentations are present at higher levels — often much higher.

MICROBES IN GRAPES

Microbes to watch out for: Non-*Saccharomyces* yeast species, lactic acid bacteria, acetic acid bacteria

Danger signals: Mold and/or rot, signs of spontaneous fermentation, acetic acid (vinegar) or ethyl acetate odor

Monitoring methods: Sensory cues, microscopic exam, PCR-based genetic testing

Mold/Rot

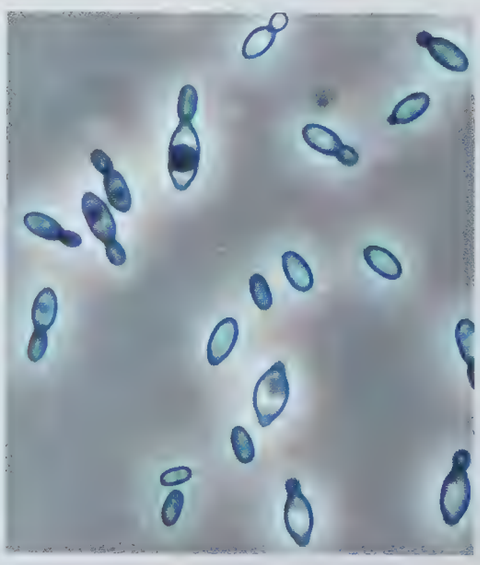
If grapes arrive with mold and/or rot, take photos and save an uncrushed sample to freeze immediately as a record of the grapes' condition. Test laccase (responsible for the browning of white wines and discoloration of red wines) and volatile acidity (VA), and consider rejecting fruit if VA is more than 0.1 g/L in juice. Note that crushing of grapes may be considered legal acceptance of the grapes "as is."

After grapes that were not completely healthy are processed, take a sample from the tank and examine it under the phase-contrast microscope for bacteria and yeast. Fortunately, molds are very intolerant to alcohol, so they die as soon as fermentation begins. It is normal to see a few yeasts, but no more than about 5 per 40x field. There should be no bacteria, or at most one rod-shaped bacterium in several 40x fields. Even one *Acetobacter/Gluconobacter* cell seen under the microscope is too many.

If any *Lactobacilli* are seen, add lysozyme to the must immediately, or continue to monitor the batch microscopically once per day, to see if the population increases. Also monitor growth of non-*Saccharomyces* yeasts, as discussed below.

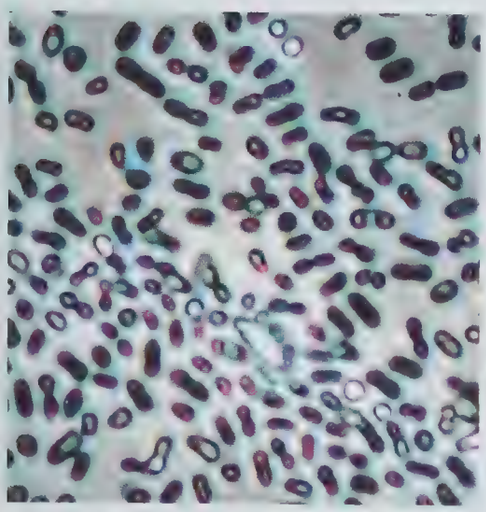
Please see "Spoilage microbe population fluctuations during winemaking — causes, effects, solutions" by Robert Tracy, May-June 2009 PWV journal.

***Non-Saccharomyces* yeast in stuck wine**



Kloeckera apiculata

***Non-Saccharomyces* (small) and *Saccharomyces* in stuck Chardonnay (by Nicola Wilton)**

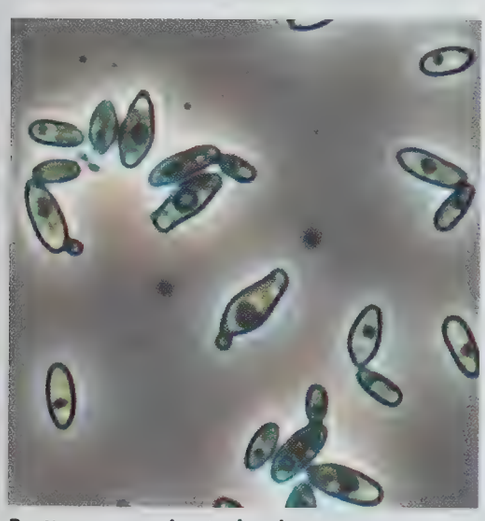


***Acetobacter* in wine**

Non-Saccharomyces yeasts from grapes

There are yeasts on grapes, though very few are *Saccharomyces*. *Kloeckera apiculata* (teleomorph *Hanseniaspora uvarum*) is the major species, and there are quite a few other species also. Some are sensitive to alcohol, or are aerobic so they cannot grow during fermentation, but they may grow before or during the start of fermentation. Other species may survive until middle to late in the fermentation process.

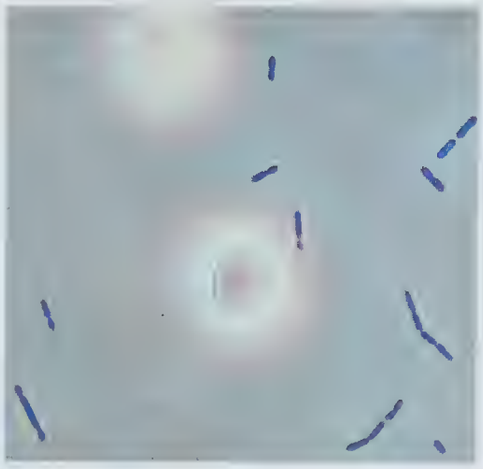
If odors of ethyl acetate (airplane glue/nail polish remover), amyl acetate (banana skin), or other off-odors appear in juice or must, examine immediately under a phase-contrast microscope for yeasts that are not the round/ovoid shape of *Saccharomyces*. Non-*Saccharomyces* yeasts are sometimes round, but more often have other appearances: apiculate (pointy), elongated, or bizarrely shaped, and they may be unusually small or large.



***Brettanomyces* in stuck wine.**

Kloeckera is especially problematic for several reasons. Their SO_2 sensitivity is comparable to that of *Saccharomyces*, and they are naturally cold-tolerant so they grow readily in cool must (10 to 15°C). They can survive much farther into the fermentation than most other non-*Saccharomyces* species, sometimes all the way to the end.

Sometimes a thick, slimy scum forms, or stringy clumps that fall out later as fluffy lees. *Kloeckera* can make prodigious amounts of ethyl acetate and amyl acetate, and is quite efficient in quickly depleting nutrients, particularly thiamine and other vitamins. Microscopically, it resembles bowling pins or thin lemons with a knob on each end.



Yeast and Lactobacilli in stuck wine (by Patricia Roca)

Kloeckera is easy to culture because it is cycloheximide-resistant and grows in one to two days, unlike *Brettanomyces* (three to seven days), which *Kloeckera* resembles. There are also PCR primers for *Kloeckera*, and for *Pichia membranifaciens*, which could be used at this stage, though not for other non-

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Saccharomyces vineyard species, so those will not be detected by PCR.

However, the question is not whether there are *Kloeckera* and other vineyard yeasts in the must (there are), but how to monitor their population, and how to handle the must so that they do not grow too extensively. For this purpose, following the must microscopically, estimating percentages of non-*Saccharomyces* species, is more useful. Before fermentation begins, if more than 5 or 10 non-*Saccharomyces* yeasts are seen in a 40x field, a problem is developing.

Examine some musts microscopically every day, especially any must over 10°C that are soaking on skins or warming up from soaking/settling, or musts that start fermenting spontaneously. Also examine microscopically if acetate or amyl acetate odor is noted.

Summary of Wine Microbes — How Many are TOO Many?

IN FERMENTATION	
Kloeckera	Juice: more than 5 per 40x field During fermentation: more than 10% of yeast population (*Saccharomyces* should take over) Stringy clumps are not desirable
Other vineyard yeast	More than10% of yeast population
Schiz. japonicus (8 spores)	Any
Saccharomyces	Should have more than 2 million/ml at inoculation; more than 100+ million/ml during ferment Viability: should be 50% at rehydration; more than 90% at start of ferment; more than 25%+ near end of ferment
Dekkera/Brettanomyces	Any (determine by culturing or PCR)
Surface film yeast	1 per 40x field
Oenococcus	At least 1 million/ml if MLF desired Any observed under microscope if MLF not desired
Pediococcus	Any observed under microscope
Lactobacillus	2 per 40x field if population increasing
Acetobacter	Enough to see under microscope
IN ML STARTERS	
Saccharomyces	Should be fermenting with elected, ML-friendly yeast to acclimate bacteria to alcohol
Dekkera/Brettanomyces	Any (determine by culture or PCR)
Surface film yeast	Any observed under microscope
Pediococcus	Any observed under microscope
Lactobacillus	2% to 5% if population is rising and starter is for wine with residual sugar, 10% to 20% if starter is for dry wine
Acetobacter	Any observed under microscope (scan very thoroughly — they may all be in a large clump, not scattered, or in little clumps that are hard to recognize); test with PCR if not sure

YEAST FERMENTATION

Microbes to watch out for: Non-*Saccharomyces* yeasts, lactic acid bacteria

Danger signals: Spontaneous fermentation, ethyl acetate or other off-odor, sluggish fermentation, spontaneous malolactic fermentation (MLF), low viability of yeast inoculum, VA increase

Monitoring methods: Microscopic exam, sensory cues, chemical tests, PCR-based genetic testing

Saccharomyces

When preparing dry yeast, check viability with methylene blue stain to make sure that enough survived transport, storage, and rehydration in the winery. Approximately half of the rehydrated yeasts should be viable, as evidenced by lack of blue staining. Counting yeasts with a hemocytometer also helps to monitor the population to be sure that it reaches 10^8 cells/ml, or a stuck ferment is likely.

Non-Saccharomyces

Some winemakers encourage the growth of some non-*Saccharomyces* vineyard species to contribute to aromatics, complexity, and mouthfeel before *Saccharomyces*, which must become dominant for the fermentation to go to completion, takes over. Potential problems with this approach include depletion of vitamins and nutrients (natural and added) that *Saccharomyces* will need, production of off-characters such as H_2S, ethyl acetate, and acetic acid, and possibly inhibition of *Saccharomyces*.

It is very important for winemakers encouraging participation by vineyard yeast species to guard vigilantly against their extensive growth. Many stuck fermentations have their origins early on, as growth of competing species did not allow *Saccharomyces* to achieve a large population of healthy yeasts. The winemaker may look for a cause late in fermentation, but what happens at the beginning can set the process in motion.

Spontaneous fermentations, whether intentional or not, should be checked microscopically until *Saccharomyces* becomes the dominant yeast. If *Saccha-*

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romyces does not take over within the first day of fermentation, a large inoculum of a vigorous active-dry yeast may be required (even if no yeast addition was originally planned). If non-*Saccharomyces* yeasts reach 10^6/ml or more, the population may need to be reduced by centrifuging or filtering, before inoculating with properly rehydrated dry yeast.

Nutrient additions to uninoculated fermentations should be delayed until *Saccharomyces* is recognized under the microscope, or until a clean-smelling fermentation is under way. Fermentations with more than around 10% non-*Saccharomyces* yeasts should be considered at high risk and carefully watched for signs of sluggishness.

Lactic acid bacteria

Spontaneous growth of lactic acid bacteria during fermentation can sometimes be a positive occurrence, if the bacterium is *Oenococcus oeni*, MLF is desired, and no trouble in finishing the yeast fermentation is expected. If MLF is not desired, or if the yeast fermentation could stick late in fermentation, even *Oenococcus* can be a problem. Never inoculate a struggling fermentation with ML bacteria.

But if certain heterofermentative *Lactobacillus* species (called "ferocious" by Dr. Ralph Kunkee) grow when there is fermentable sugar, the result can be a disaster, traditionally called "piqure lactique." This is more common in musts with higher pH (>3.6). Besides converting malic to lactic acid, they metabolize glucose and fructose to acetic acid, raising VA to 1 g/L or higher. Acetic acid, along with toxins that at least some species produce, is inhibitory to *Saccharomyces*, and the fermentation may stick. While *Oenococcus* is heterofermentative and thus theoretically could cause this type of spoilage, in fact *Lactobacillus* is overwhelmingly the bacterium responsible.

Lactobacillus spoilage may go undetected until too late. Because *Lactobacilli* do not make ethyl acetate, there is no telltale odor, and sugar can mask the acetic "bite" at the finish. Culturing is not recommended because wine *Lactobacilli* grow very poorly in culture, and often do not grow at all. PCR-based tests detect certain ranges of lactic acid bacteria, but not necessarily all wine *Lactobacilli*. For example, at present the Scorpion test detects only three wine species (*L. plantarum, hilgardii,* and *brevis*), though others may be responsible instead.

Microscopic examination easily determines whether *Lactobacilli* of any species are growing. If there are enough cells to cause a problem, there will be a large enough popula-

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tion to see. Chemical tests can alert the winemaker to check for *Lactobacillus:* pH rise, drop in malic or rise in lactic acid, and rise in VA/acetic acid.

STUCK WINES

Microbes to watch out for: Lactobacilli, Pediococcus, Acetobacter, Brettanomyces, surface film yeast

Danger signals: CO_2 production, spontaneous MLF, VA rise, film on surface

Monitoring methods: Visual, microscopic exam, PCR, culturing, chemical tests

Stuck wines are extremely susceptible to spoilage. The sugar offers a substrate for a number of microbes, and any efforts at encouraging completion of fermentation, including warming, aerating, and nutrient addition, will also encourage spoilage microbes.

To determine whether non-*Saccharomyces* yeasts helped cause a stuck ferment, take an unstirred sample and then a stirred one.

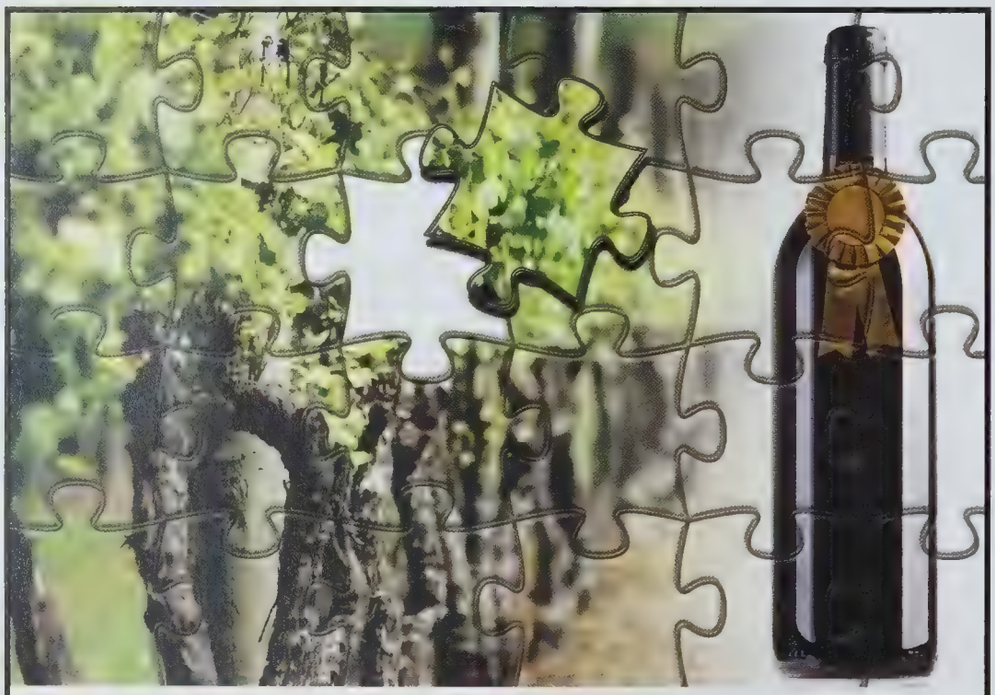
In the settled lees, there may be large numbers of odd-shaped yeasts, culprits that have died after causing, or contributed to causing, the stuck fermentation. Non-*Saccharomyces* yeast severely deplete nutrients and vitamins that *Saccharomyces* need, and they may also have some inhibitory activities.

Lactic acid bacteria

Stuck and sluggish wines are often attacked by *Lactobacilli* (as described above). Any CO_2 production in a stuck or sluggish wine should be viewed with suspicion, for it could be caused by *Lactobacilli* (or *Brettanomyces*) rather than *Saccharomyces* resuming fermentation. Monitor stuck wines every day or two under the microscope while reinoculating with fresh yeast. In wines over 3.6 pH, it may be advisable to reduce pH or add lysozyme prophylactically, to reduce the chance of *Lactobacillus* spoilage.

Brettanomyces/Dekkera

Fortunately, very few musts become contaminated with *Brettanomyces*, and anyway, they tend to grow slowly compared to *Saccharomyces*. Stuck wines may become infected, especially if they are moved to wood to complete the fermentation. To detect *Brettanomyces* as soon as possible, culture any stuck red wine once per week, or check periodically by PCR. Production of 4-ethyl-phenol/4-ethyl-guaiacol (4-EP/ 4-EG) lags behind cell growth so this is not the best way to discover a new Brett infection in a stuck wine. Certainly, if apiculate yeasts are seen microscopically in a stuck wine, it should be tested for *Brettanomyces* imme-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diately, but by that time the population may be already quite high.

Film on surface

Both *Acetobacter* and surface film yeasts (mainly *Candida* and *Pichia*) enjoy conditions that prevail in a stuck wine during reinoculation: warm, low SO_2, not topped. Any film should be examined microscopically. To prevent film, the container should be brought as full as possible, and CO_2 or other inert gas used liberally. *Acetobacter* can also be discouraged by lowering pH, but yeasts are not as sensitive to low pH as are bacteria.

Dry wines undergoing extended maceration are also at risk from *Acetobacter*, because there is not enough CO_2 produced to prevent their growth.

ML FERMENTATION

Microbes to watch out for: Acetobacter, Lactobacillus, Pediococcus, Brettanomyces, *Oenococcus*, surface film yeasts

Danger signals: VA rise (rise > 0.15 g/L, which is produced by *Oenococcus* from citric acid) in stuck wine, film on surface, off-odors or flavors

Monitoring methods: Sensory cues, microscopic exam, PCR

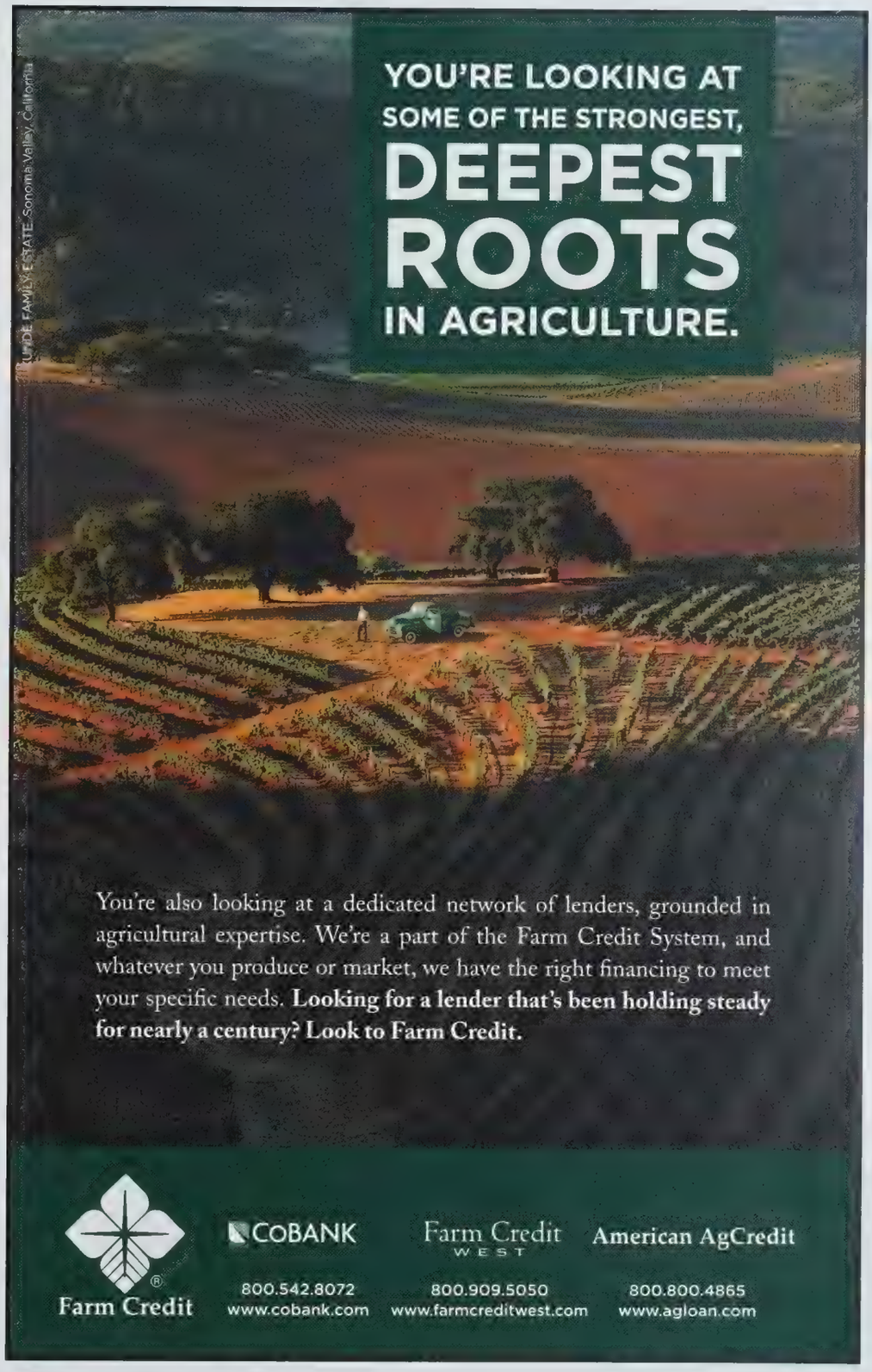
Commercial freeze-dried cultures are produced following extensive quality assurance procedures to be sure they are free from contaminants. Once they are put into must or wine, the resident bacterial flora may grow along with, or instead of, the inoculated strain(s).

Check wines during MLF for spoilage bacteria, both microscopically and by PCR methods, if possible. This is especially important if the culture is propagated before adding it, allowing unwanted lactic acid bacteria more opportunity to grow as well (or instead), and also giving aerobic yeasts and acetic bacteria a chance to spoil the starter. *Acetobacter* growth is particularly unfortunate in ML starters and during MLF. Microscopically, it is sometimes confused with *Oenococcus*.

If *Lactobacillus* and/or *Pediococcus* are a significant part of the wine's bacterial flora, it may be best to kill them with lysozyme and reinoculate with a resistant *Oenococcus* strain. However, if the wine is dry, the winemaker may decide to accept the presence of some *Lactobacilli* during MLF, despite a tendency to introduce "pickle" or "sauerkraut" aromas.

Pediococci can make lactic acid from sugar but not acetic acid. They are considered undesirable mainly because some can continue growing after wine is dry and has finished MLF, and because of biogenic amine production, though off-flavors have been ascribed to some strains.

In cellars heavily infected with *Brettanomyces*, culturing once a week or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BOOK EXCERPT

FROM DEMON TO DARLING

A LEGAL HISTORY OF WINE IN AMERICA

RICHARD MENDELSON

BY Richard Mendelson

In 1975, Richard Mendelson arrived at Oxford University and left two years later with a deep respect for the law and a deeper appreciation of the fine Burgundies in the University's wine cellars. Mendelson became an expert in wine law. *FROM DEMON to DARLING* is a narrative on the legalities of the religious Temperance movement that led to Prohibition itself, the strangling state laws that tried to control alcohol after Repeal and the continuing legal battles both for and against alcohol today. This *Conclusion* is excerpted from the 302-page book.

Conclusion

Wine in America is a story of fits and starts, of lost opportunities followed by progress, and then by setback. Much of this can be traced to wine's agricultural roots.

Whereas the Founding Fathers were prepared to support a domestic wine industry, farmers lacked the expertise and plant material to grow decent quality wine grapes. The propagation of hybridized vines solved that problem, but the winemakers then had to contend with adulterated wines already on the market. Just when the industry began to establish a reputation for quality, phylloxera took hold, and that scourge was followed by ever stricter state prohibitory laws — and then national Prohibition.

With this understanding of the backdrop, the wine industry's vision and accomplishments after Repeal are nothing short of amazing. This country established an authentic wine culture from scratch in a single generation.

The base remains narrow — 36% of Americans are teetotalers[1] — but that makes the potential for growth more exciting, particularly with the prospect of expanding direct-to-consumer sales and the popularity of wine not only among the aging Baby Boomers born between 1946 and 1964 but also among their children, the Echo Boomers.[2]

The fact that the Supreme Court in 2005 decided an important case specifically about wine, not beer or spirits, is almost as significant as the decision itself. Public attention is now focused on wine, just as it was after "French Paradox" was aired on television.

From colonial times through Prohibition, beer and spirits had set the tone for the anti-alcohol debates. Demon rum and brewery-owned saloons were the rallying cries for temperance reformers. Not even the Bible, with its numerous references to wine, could separate wine from beer and spirits.

Court cases challenging the prohibitory state laws in the latter part of the nineteenth century were brought by brewers mostly, distillers occasionally, but rarely by wineries. Wine made up a very small part of the overall liquor market, and much of it was reserved for the elite.

Today, wine is increasingly popular and affordable in America. Wine appreciation is growing nationwide. Yet there is no national consensus — nor will there be one anytime soon — on the role of wine in American society and culture. Americans have not even agreed on the meaning of temperance.

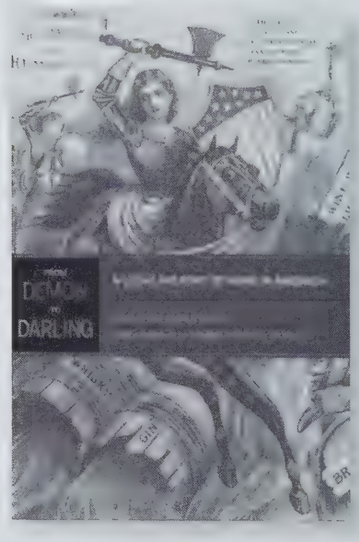
To Increase Mather, a minister at the turn of the eighteenth century, temperance was the avoidance of drunkenness. To Benjamin Rush, a doctor one hundred years later, it was the avoidance of distilled spirits; wine was acceptable when served with meals and consumed in moderation. To Wayne Wheeler, a lawyer at the turn of the twentieth century, temperance was total abstinence from all three "Booze Brothers" — beer, wine, and spirits. The views of these three American leaders reveal the diversity of American attitudes and perspectives about liquor.

Continued on page 68

Richard Mendelson directs the new Program on Wine Law and Policy at the University of California, Berkeley School of Law. He is of counsel to the law firm of Dickenson, Peatman and Fogarty in Napa and Santa Rosa and also sells wine under the Mendelson label.

This book was published by University of California Press in 2009. This book won the 2009 prize for best book in the field of law, awarded by the 44-nation International Organization for Vine and Wine.

"Compelling....Reveals as much about Americans' attitudes towards themselves as about their understanding of wine."
—Paul Lukacs, author of *American Vintage*



From Demon to Darling
A Legal History of Wine in America
RICHARD MENDELSON
Foreword by Margrit Biever Mondavi
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TEST YOUR SMOKE TAINT KNOWLEDGE

BY John Katchmer, Enologist
Vinquiry, Inc.,
Windsor, CA

Because of the effects of California wildfires, there have been numerous articles about smoke taint in wine. Below is a short quiz to test how much you have learned. Good luck!

1. Common sensory descriptors for smoke taint include all but the following:
   a. Smoky,
   b. Ash tray,
   c. Smoked salmon,
   d. Barbeque,
   e. All of the above.
2. When grapes seem **most** vulnerable to smoke taint is:
   a. The weeks after flowering,
   b. The week after veraison,
   c. Three weeks after veraison,
   d. At harvest.
3. The majority of smoke taint compounds appear to be located in the:
   a. Surface of the grape skin,
   b. Grape skin,
   c. Pulp,
   d. Seeds.
4. Harvesting and handling treatments that will reduce the concentration of smoke taint include:
   a. Washing grape clusters,
   b. Hand harvesting,
   c. Use of free run juice,
   d. Use of a smoke-neutralizing agent,
   e. a and d,
   f. b and c.
5. Several compounds comprise smoke taint; however, two compounds used as markers for smoke taint are:
   a. Acetic acid and ethyl acetate,
   b. Guaiacol and 4-methylguaiacol,
   c. N-propanol and isobutanol,
   d. 4-ethylphenol (4-EP) and 4-ethylguaiacol (4-EG).
6. It is possible to measure the amount of the marker compounds using a:
   a. Gas Chromatography (GC),
   b. Cash Still,
   c. Gas Chromatography-Mass Spectrometry (GC-MS),
   d. Enzymatic methods.
7. The sensory threshold for guaiacol is in the low:
   a. Parts per trillion (ng/L),
   b. Parts per billion (ug/L),
   c. Parts per million (mg/L),
   d. Parts per thousand (g/L).
8. The difficulty in obtaining accurate levels of smoke taint compounds in juice has to do with:
   a. There is no problem. The compounds are easy to measure.
   b. The majority of the compounds are not in a "free" form, but are rather bound to sugars, thus resulting in a potentially false negative result.
   c. The juice is thick, turbid, and sticky, thus making it difficult to run on a GC-MS.
   d. There are other compounds in juice that mimic smoke taint compounds.
9. Ways to remove smoke taint compounds include all but the following:
   a. Reverse Osmosis,
   b. Specific fining agents,
   c. Aeration,
   d. Spinning Cone.
10. Which of the following statements is true:
   a. Once all free smoke taint compounds are removed, no additional smoke taint can occur.
   b. Once all free smoke taint compounds and precursor compounds have been removed, no more smoke taint will occur.
   c. Smoke taint, once formed, can re-occur at any time.
   d. It is impossible to remove smoke taint completely.

ANSWERS:

1) **E** This is a trick question. All of the descriptors listed have been used to describe smoke taint. In addition, there is also a particularly unpleasant ash-like, drying retro nasal character in the aftertaste.

2) **B** Australian research has indicated that the optimum time for smoke taint compounds to be absorbed is the week after veraison. This may account for varietal variability, and variability within varietals (same varietals, but maturing at different rates).

3) **B** Nearly all research points to the smoke taint compounds being contained in the tissue layers of the skin. When assessing for potential smoke taint, it is recommend to chew the skins.

4) **F** Hand harvesting is recommend over mechanical harvesting (no doubt because it is more gentle), and free run juice has less smoke taint compounds. There is no such thing as a smoke-neutralizing agent!

5) **B** This is a trick question. Guaiacol and 4-methylguaiacol are the main markers, and guaiacol is usually found in a larger quantity than 4-methylquaiacol. Nevertheless, 4-ethylphenol and 4-ethylquaiacol, although normally associated with *Brettanomyces* spoilage, are also detected in smoke-tainted wines.

6) **C** The usual method for measuring guaiacol and 4-methylguaiacol is by GC-MS headspace analysis. If you do not have one in your laboratory, contact a laboratory that does!

7) **B** Guaiacol threshold levels are in the low (5 to 25) parts per billion (ug/L). This makes it higher than TCA, H_2S, but lower than 4-EP and 4-EG in *Brettanomyces* spoilage.

8) **B** Because most of the smoke taint compounds are in a bound state with sugars, it is difficult to analyze for them. Without some form of acid or enzymatic hydrolytic treatment, there is a real danger of receiving false negatives (low numbers, but actually high levels of potential smoke taint present). This is obvious if one chews

the skins and realizes there is major smoke taint present, but is receiving low GC-MS numbers. One should inquire whether some sort of hydrolytic treatment is being used on the juice prior to measurement on the GC-MS.

9) **C** Aeration will not remove smoke taint. Reverse osmosis has been found to successfully remove free smoke taint compounds. The use of fining agents is based on sensory evaluation. Where the level of smoke taint is relatively low, fining agents may be able to address the situation. Trials need to be performed before any treatments are done. Spinning cone shows promise as yet another way of removing free smoke taint compounds.

10) **B** If only free compounds are removed, and there are still precursors present, smoke taint can re-occur (although no doubt at a much lower level). Australian research has shown that certain compounds can continue to be generated after one year in the bottle. Free smoke taint compounds weigh less than conjugated compounds. Targeting a range of atomic weights for the free compounds will not necessarily include the conjugated compounds. If this is the case, there may be more free compounds involved even after treatment (although most of the smoke taint will have been removed by the initial treatment).

For more information see: Krstic, M.P. and J. Whiting. "Understanding the sensitivity to timing and management options to mitigate the negative impacts of bush fire smoke on grape and wine quality — Scoping study." Victorian Department of Primary Industries, 2007, 59 pages.

A range of other material on smoke taint can be accessed on the GWRDC homepage: http://www.gwrdc.com.au/; look on the right-hand side of the page and you will see an array of materials that may be of interest, including the above report.

Some research in Western Australia (Kristen Kennison — during her PhD studies) has indicated that there does appear to be a "hightened" period of sensitivity to the absorption of smoke compounds phonologically between veraison (berry softening) and 7 to 14 days after that. However, its important to acknowledge that these compounds can be accumulated in fruit anytime between fruit set to harvest, with repeat exposure at different times being simply cumulative. ■

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Key elements for successful winery e-commerce strategy

BY Leah McNally,
Club and Direct-to-consumer Concierge,
Stag's Leap Wine Cellars,
Napa, CA

During the past decade, e-commerce has emerged as a major marketing method and sales channel, and it is showing steady growth within the wine industry. The United States became the first mover in e-commerce beginning in 1995 due to its liberal business policies, however the wine industry, both in the U.S. and abroad, was slow to follow.

Bumpy start with e-commerce in the wine industry

Initially, e-commerce was touted to be a new sales model that would bring about the demise of the traditional sales channels.[10] A 1999 survey showed that the number of retailers planning to use the web for sales had doubled between 1997 and 1998,[13] but actual reported sales of 0 to 3% were typical. By 2000, following the demise of a number of early adopters, the economic viability of e-commerce and Internet sales models were questioned.[10]

A 2001 study by L. Thach and C. Eaton looked at e-commerce adoption in the wine industry. Out of 812 responses to a survey on e-commerce use, 69% of the responding wineries had a website, but only 65% of those wineries reported having an e-commerce strategy.[16] There were no sales figures collected. Most businesses who responded were more comfortable using the Internet for research, e-mail, and business to business (B2B) applications.

A more global survey of wine producers by Oliver Richardson (2002) included wineries in New Zealand, Australia, U.S., Canada, United Kingdom, France, South Africa, and the Netherlands, and found similar results. 70% had a website, but very few wineries reported successful sales, and average figures were no higher than 3%.[13]

Problems cited by wineries in 2002 involved availability of product, finding the right customers, payment security, shipping, sales tax collection, and driving traffic to the website. Many mid-size and large wineries also mentioned that selling directly to consumers would conflict with distributor relationships. The majority of website usage was reported as informational for both consumers and the trade.

As a result of these findings, Richardson asked, "Is wine suitable for sales via the web?" and noted that, because wine is "sense related," convincing customers to purchase over the Internet is a challenge. Richardson theorized that the Internet might be better suited to relaying information to customers than to selling wine in any quantity.[13]

Richardson, and then N. Stevens and E. Burns in a similar study comparing New Zealand and German winery websites,[15] note that many sites viewed for the studies were failing to keep information updated and to implement high-quality web design. The websites were mainly focused on details about the wine and were lacking social aspects that draw customers in, such as lifestyle and tourism.

Wine e-commerce is more successful today

Three years later, dramatic differences have emerged in the e-commerce landscape. Although still a small overall portion of revenue, the number of Internet-based wine sales has doubled from 3% to 7% of total sales.[5]

A survey of U.S. wineries by L. Berglund and M. Tinney found the majority of participating wineries reporting a large increase in direct-to-consumer (DTC) sales between 2006 and 2007, with an average increase of 74% for wine club participation and the e-commerce channel.[1] In this study 97% of wineries surveyed reported that they felt "they had a long way to go in terms of maximizing [direct-to-consumer] sales," showing how much had changed in just a short time.

What brought about this dramatic change? The industry has moved from questioning if wine sales were appropriate to focusing on e-commerce as a growing sales channel with huge future potential in just a few years.[13] While positive change in interstate shipping laws certainly accounts for a larger market opening within the U.S., the main gains will come from a change in the direction of e-commerce wine strategy, regardless of winery location.

Wineries struggled to find more online sales promised by the initial wave of interest in the Internet.[13] It became obvious for companies from many industries trying to compete in the e-commerce market that simply having a website was not enough in itself to create sales.

The largest benefit of e-commerce has been to consumers. The increase and availability of information has made the cost of substitutes low and focused the market on price.[10]

M. Porter predicted that "new Internet technologies will continue to erode profitability by shifting power to the customers."[10] Unless businesses in general, and wineries in particular, are willing to allow margins to erode, price cannot be the sole selling point. The wine industry faces an additional chal-

Table I: Four key elements for a successful winery e-commerce strategy

Company-wide Commitment	Build Brand Loyalty	Build Trust	Online Relationship Management
Integrate e-commerce into master strategic plan	Maximize existing opportunities: Wine tourism, Tasting room, Special events	Professional web design = perception of wine quality	Track and analyze customer data
Be proactive in brand perception	Create best possible customer experience	Ensure ease of use for consumer	Develop specific content for consumer segments
Provide leadership for the DTC channel	Gather data to build e-mail list	Use content to decrease consumer confusion	Less contact with more specific content: Intimacy, Accuracy, Immediacy
		Emphasize customer service/ order fulfillment	

lenge since the opportunity for consumers to directly experience a wine is an important selling tool.[13]

Strategy makes an impact on wine e-commerce

Several researchers suggest that wineries that devote the effort to creating a strategy and integrating it into the overall business plan will fare best with e-commerce.[1,11,12]

"Many of the companies that succeed will be ones that use the Internet as a complement to traditional ways of competing," Porter states, "not those that set their Internet initiatives apart from established operations."[10]

Wineries have a unique opportunity to build e-commerce sales upon existing relationships created through reputation, tasting room visits, and personal recommendations that allow them to overcome the barriers to experience that usage of the Internet creates.

S. Quinton and S. Harridge-March suggest that wineries and wine retailers aren't putting enough effort into developing long-term strategies and instead focus on short-term tactical moves.[11] "Tactical" is defined as providing information as a "mass marketing" experience and letting the customer decide if the brand has credibility. Strategic approaches involve participation from "all functions of the organization," not just sales and marketing, including actively seeking consumer feedback on their perceptions and creating communications tailored to the customer.

Nicholas Shoults, senior account executive at Benson Marketing Group (Napa Valley, New York City), has a similar opinion: "Wineries tend to see e-commerce as a 'silo' standing alone rather than being integrated with tasting room and sales channels. It is important to have everyone on the same page. One thing Benson Marketing does is to look at the entire winery program. How can we use the same messaging across all channels, including DTC, social networking, e-commerce, PR, sales, and marketing?"

Four key elements for a successful winery e-commerce strategy

Research suggests there are four important areas to be considered when creating a successful e-commerce strategy. These are outlined in Table I and described in more detail below.

1) Commitment — Making a company-wide commitment to e-commerce is one of the most important steps. Wineries often create websites and set goals, but fail to commit to support the needs of the sales channel in order to be successful. E-commerce should not stand alone without ties to the rest of the operation.

Branding and brand loyalty should be encouraged through all sales channels. Strategic thinking should be applied to the value of the e-commerce customer for the winery, and what the customer's perceptions will be at all levels of interaction.[11]

Wineries should consider creating a DTC manager position and, depending on winery size, having additional dedicated staff. Berglund and Tinney found that wineries that have a single individual in charge of all DTC operations have greater returns on their investment into e-commerce.

Kurt Ammann, manager of consumer direct marketing for Dierberg and StarLane Vineyards (Santa Ynez, CA), and their Three Saints brand, shares his experiences. As the first DTC manager for Stag's Leap Wine Cellars in 2004, he created a strategy that inte-

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grated the tasting room, wine club, and direct-to-consumer channels. Ammann reports that previously there had been no direct marketing effort and e-commerce sales were flat.

"I set goals and crafted campaigns to create exclusivity, differentiate the tasting room, and reduce inventory using wines that were not available in the market," explains Ammann. Sales via DTC channels at Stag's Leap Wine Cellars increased 300% between 2004 and 2007 due to Ammann's efforts. In his current position at Dierberg, Ammann is using his experience to build DTC sales for the new winery.

2) Build brand loyalty — In ten years, we have moved from questioning whether wine is suitable for Internet sales[13] to witnessing the doubling of sales.[5] Wineries have a unique chance to overcome the inherent drawbacks in Internet branding and turn wine tourists into loyal customers.[10]

Shoults suggests that wineries collect customer data at every possible consumer "touch point" such as in the tasting room, at events, and via the e-commerce site. Valuable information can easily be obtained by suggesting interested customers join a mailing list or answer surveys while visiting, in exchange for a small discount or other reward.

Barbara Insel notes that the majority of e-commerce sales come from occasional buyers influenced by wine tourism.[5] Visitors can also spread a winery's reputation through word of mouth. Personal recommendation weighs heavily in creating brand loyalty both in e-commerce and traditional channels. Focus should be placed on influencing future behavior through top-quality service for all visitors, to build trust and facilitate more confident online purchasing.[12]

Kandice Carlson, Loyalty Marketing Manager at Ste. Michelle Wine Estates (Woodinville, WA), shares her views on loyalty: "The website isn't developing loyalty by itself — it is an excellent tool to build a foundation. Customer service and personal contact form the backbone. We encourage consumers to ask questions and create a relationship that the website enhances.

"The first purchase a customer makes is the most important. People using the website usually have some [positive] experience with the wine before they decided to visit the website. [Good customer service and a well-designed website] determine if the buyer will come back."

Ammann suggests that small wineries with limited distribution can leverage loyalty to create "pull" for a wine in the market. "Customers often read reviews or experience the wine in restaurants, but cannot find it in their area. They come to the Dierberg website for more information and to buy wine."

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A positive experience using the website helps create brand loyalty and demand in the local market.

3) Build trust through using well-designed website — Whether a customer has visited a winery or not, building trust is key to making customers comfortable buying wine online. Several researchers have reported a high amount of consumer confusion regarding purchasing wine.[12] One way that wineries may want to decrease this confusion is by offering content that educates a customer and allays worries about making the wrong choice.

Sales-based websites that help customers feel informed generally perform better in overall sales.[14] David Scott points out that websites often miss the opportunity to inform and entertain consumers rather than just answering questions. Quinton and Harridge-March note that the most successful players in the United Kingdom online wine market use a mix of information and customer feedback to establish credibility with consumers.[11]

Carlson emphasizes, "Ste Michelle's goal is to use imagery to communicate brand essence and influence consumer

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perception. The company is looking to send a brief, succinct message about the wine [to consumers viewing the website]."

Many consumers judge a company's trustworthiness by the quality of its website.[9,2] A study of millennials and winery websites by L. Nowak and S. Newton reports first impressions are crucial. A high-quality website leads to increased perceptions of wine quality. High-quality characteristics that consumers expect include attractive design, ease of navigation and use, and information that is kept current.

Ammann made the integration of technology a priority at Dierberg Vineyards. "The initial investment into the website was a pretty significant amount of money for a small winery. The result is that all of the registers, the website shopping carts, and compliance functions talk to each other. Customers can make changes in their online accounts and those changes flow through to the rest of the system. It makes us more compliant, more responsive [to customers], and is much easier on employees."

Websites need to be maintained on a regular basis to stay relevant and high-quality. A website could be on the cutting edge when it is originally implemented, but if it is not maintained and updated periodically, changes in technology can leave it looking outdated.

"Each [Ste. Michelle Wine Estates brand] site is being revisited to refresh the design," says Carlson. "While content might not change significantly, we are looking to add more images, update colors, and site architecture by gathering relevant information onto one page rather than making customers search for it. One goal is to implement new coding for better formatting and flash integration, along with integration of ordering, account history, and compliance to better serve customer needs."

Links and technology need to be revisited to check for errors that can impede customer usage. Carlson adds, "Companies centered around e-commerce such as Expedia or Amazon review mechanics and information on an almost daily basis."

Daily maintenance might take more resources than most small wineries can devote to the task, but any winery serious about its e-commerce should be testing the mechanics of its website on a monthly basis at the very least.

4) Relationship management — Online relationship management is suggested as the most sophisticated avenue to develop loyalty through online channels.[7] M. Porter supports this, noting that accumulated knowledge of customer buying behavior is key to stopping customers from switching to other vendors. A detailed understanding of customer behavior can create "tailored offerings, better service, and greater purchasing convenience."[10]

William Hauser reports that data mining by monitoring the various

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opportunities for consumer interaction gives information that can be used to "provide insights — track triggering events and behavior — and ideally predict future behavior." The ideal outcome of data mining is to create "fewer but more relevant" messages to customers, and higher customer satisfaction.[4]

Tracking customer spending and preferences includes three important features — intimacy, accuracy, and immediacy. Tracking helps create the type of loyalty through the online channel that is traditionally seen as the hallmark of brick and mortar retailers.[4] Customer data is segmented into usable categories that allow data to be analyzed and deployed into sales campaigns.

While data mining requires a commitment either from the winery directly or by using an outside company to do the work, Berglund and Tinney find that the most successful U.S. winery e-commerce programs use this sort of data to create sales campaigns.[1]

Carlson puts data mining into perspective."Ste. Michelle Wine Estate's goal is to educate customers and influence their decision to buy again. Once a consumer has made an initial pur-

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chase on the site, we might encourage them to try a more expensive wine. If the response is favorable or they make multiple purchases, the next step is to introduce them to the wine club and the benefits of membership. The ultimate goal is more relevant messages based on the customer's past buying or viewing history."

Marketing services can make automatic data mining and e-mails easier, but the challenge is, how much money does a winery want to invest? Shoults makes some recommendations for wineries with smaller budgets.

"The newer technology being used by the big e-commerce retailers, such as affinity marketing, only works well if you have a lot of SKUs. The smaller the winery is, the less important it is to segment data. More emphasis [should be placed] on customer service, collecting data, and reaching out to touch the customer." Shoults suggests sending an e-mail once a month to the customer list, announcing things like new releases, winery news or education, or events.

Carlson suggests that smaller wineries start data mining by taking a look at what parts of the website are attracting the most attention. "You want information relevant to what consumers are looking for."

A good starting point is to craft mass e-mails based on the heaviest page visits and most popular purchases. Free online tools such as Google Analytics can give wineries an idea what consumers are looking at when visiting the website.

Dierberg Vineyards uses shopping cart software to pull data for every customer who makes a purchase via the website or in the tasting room. The focus is on building a list of interested buyers for the winery's marketing efforts. Marketing e-mails sent from Dierberg average a 60% open rate, and approximately 1% of the recipients make a purchase.

Shoults sees similar results. A typical winery e-mail to an interested audience such as wine club members might have a 35% to 45% open rate and result in between 1% and 3% conversion to sales.

Conclusion

Looking at the history of e-commerce in the wine industry and the rapid changes in just a decade makes it clear that wineries should be giving careful consideration to DTC and e-commerce channels for the future.

Insel notes that the popularity of travel with wine consumers worldwide and the increase in interstate direct shipping within the U.S. make for an expanding market.[5] Evidence shows that wineries from any country that take the time to develop solid e-commerce strategies and make the commitment to following through will obtain success.

Focusing on superior customer service, professional web design, and informational content can build trust and

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brand loyalty that will encourage direct sales, and potentially enhance sales through traditional distribution channels.

Understanding and segmenting the customer database gives wineries the opportunity to reduce switching by creating intimacy and convenience in the online buyer's ordering process.

Finally, as the Internet becomes more integrated into consumer life, sales will increase for that reason alone.

Future research into this model might include tracking results of similar sales campaigns of individual wineries for comparison, and measuring responses to specific campaigns by market segment and method of consumer contact. ■

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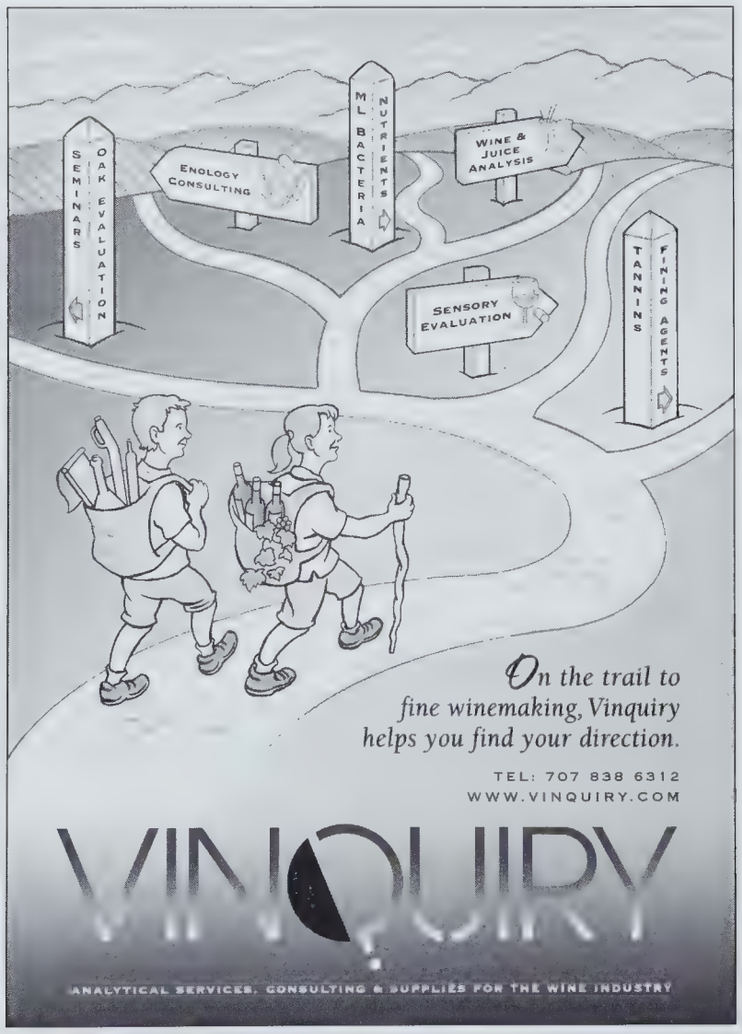

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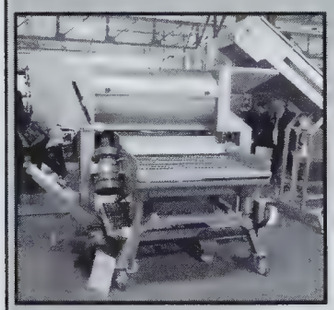

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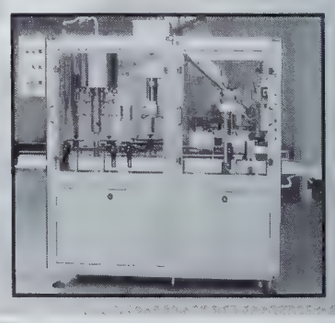

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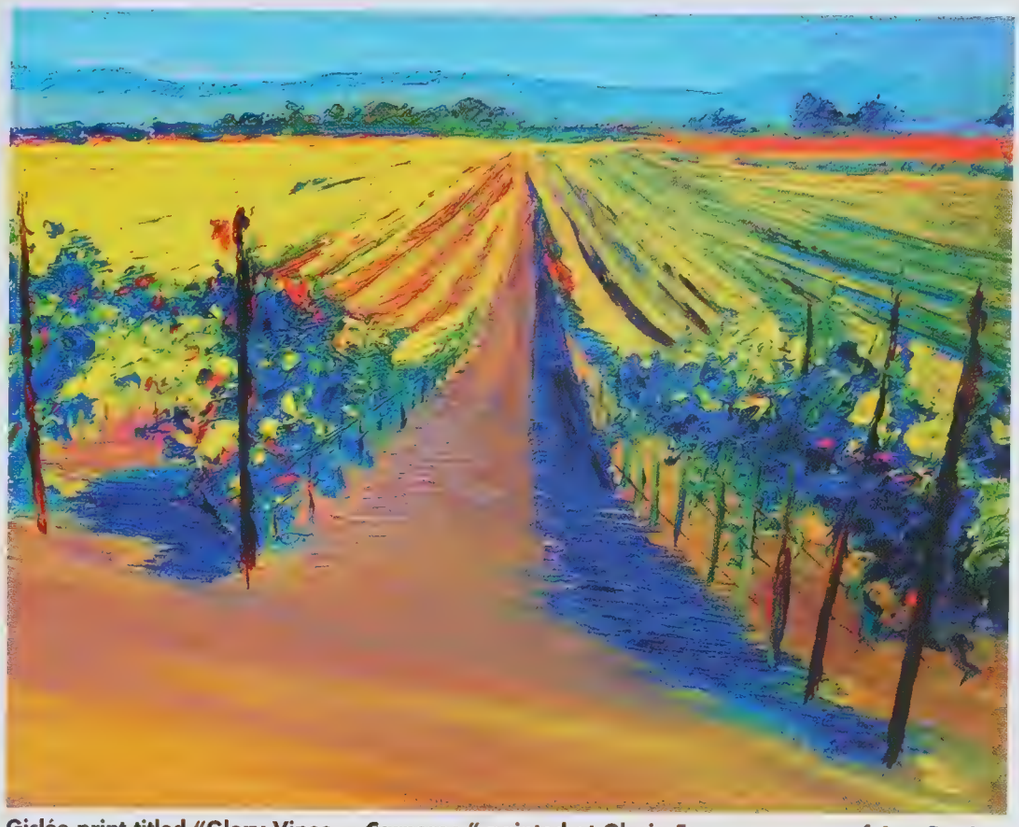
CASE STUDY

Innovative co-branding and promotional program

An interview with Eva Bertran (Executive Vice President at Gloria Ferrer Caves & Vineyards, Sonoma, CA)



Giclée print titled "Glory Vines — Carneros," painted at Gloria Ferrer, was one of Ann Rea's first vineyard series paintings. © Ann Rea.

Q: What did you actually buy with artist Ann Rea's Vineyard Portrait program?

A: We bought custom fine art merchandise including oil paintings created of and in our vineyards. Our first order included 100 collectible signed Exclusive Edition framed and unframed giclée (zhee-clay) fine art prints and 500 note cards. We bought the items from Ann at wholesale prices, and sold them at retail in our tasting room. I believe we were one of Ann's first clients in late 2004.

Q: What is the promotional value of the Vineyard Portrait program?

A: Conventional advertising and promotionis temporary and it is costly. Through collectible fine art, we gain a permanent place in our customer's homes and hearts, and we profit. The lasting value of art is that it can create an emotional connection.

Q: How much did this program cost and what is your current profit?

A: Our initial investment was about $2,000. We have received over $6,000 in profits selling the prints and gift merchandise. We also used some items as special promotional gifts.

Q: Did you pay for Ann's labor or just the wholesale merchandise?

A: No, we did not pay for her labor, travel, or lodging expenses. In exchange, however, we agreed to assist Ann Rea in selling the original field studies painted at our vineyards at our events and in our tasting room. In 2005, we also had an exclusive exhibit of her work at the winery, and an opening.

Q: What is the current sales agreement for the Vineyard Portrait program?

A: Ann has tiered-pricing with the custom merchandise tied to the sale of her paintings:

Tier 1: Ann Rea, Inc. provides the winery $5,000 of custom merchandise at wholesale prices featuring one image of a vineyard. The winery provides assistance in the sale of $5,000 or more in paintings or custom commissioned paintings.

Tier 2: Ann Rea provides $10,000 in merchandise featuring up to three images. The winery helps to sell $10,000 worth of paintings.

Tier 3: $20,000, six images, sales total of paintings.

Tier 4: $30,000, 12 images, sales total of paintings.

Q: Did you tell Ann what and where to paint?

A: No, that can only come from the artist. It is like hiring someone to write a commercial jingle or hiring an artist to compose a symphony. We would not want to interfere with this.

Mike Crumly, our VP of vineyard operations, took Ann on a vineyard tour to areas visitors do not see and showed her some of his favorite spots. Ann came back several times, and chose what to paint and from where.

Q: Is the Gloria Ferrer logo on the fine art prints?

A: No, Ann handwrites our name when she signs and titles a print. It is not meant to be commercial — that would take away from its value as collectible fine art. (We also sell in our tasting room several Michael Schwab posters with our logo.) In 2006, to commemorate the 20th anniversary of the opening of the winery, we asked Ann to create and emboss a "20th Anniversary" seal on the special prints. They were gifts to Southern Wine & Spirits executives and key people that have contributed to the success of Gloria Ferrer.

Q: What was your involvement in this process? How long did it take?

A: Not much involvement. When the series was completed, with Ann's

help, we selected the images from our section on annrea.com that we wanted to feature as prints and stationery. It took about three or four months for Ann to paint the series and to deliver the merchandise.

Q: Do you pick the images featured on your merchandise?

A: Yes, but we deferred to Ann's experience.

Q: How many of Ann's original oil paintings sold?

A: She has sold the entire series at our events, in our tasting room, and to her collectors.

Q: Do you receive income from the sale of the original field studies?

A: No, Ann Rea, Inc. owns and sells the originals. We receive income from sale of the fine art prints and merchandise.

Q: Did you buy any of the field studies?

A: Yes, we bought two of the field studies, which we proudly display in our winery. I remember it was hard to make the selection.

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Q: Does Ann retain the rights to her intellectual property?

A: Yes, she maintains exclusive reproduction rights. This is a co-branding opportunity.

Q: Have you purchased more merchandise?

A: Yes, we have ordered 14 times in five years. We have reordered giclée prints and note cards to sell, and to use as special gifts. We sent note cards to 500 restaurants to thank them for their business. We placed each card inside a leather envelope that they could use to keep mementos (pictures, letters, etc). We started their collection with an image of our vineyards by Ann. People loved it.

Q: What was the response to these promotional gifts?

A: It was fantastic. People were very flattered and genuinely thankful. Gloria and Jose Ferrer took several prints to Barcelona, Spain to give to their sons Pedro and José Maria, who had lived in Sonoma and managed Gloria Ferrer for years.

Q: How many vineyards does Ann paint in a series?

A: One only, as each series is an exploration of the unique visual essence of the terroir. French Impressionism, the tradition Ann paints in, is about an artistic exploration of a particular time and place. Ann can only do a few series in a year so her services are limited.

Q: Do your winery guests seem to gravitate toward Ann Rea's colorful vineyard prints, originals, and accessories as a unique way to remember their visit?

A: Yes, they are the first thing that you see when you come in the door and it is a way for them to take something home that reminds them of their visit here long after the wine is gone. ■

CALENDAR

October 10 Santa Barbara County Celebration of Harvest

Santa Barbara County Vintners hosts the 2009 Celebration of Harvest festival, [1pm to 4pm] at Rancho Sisquoc Winery, located on the outskirts of Santa Maria, CA. Winemakers, viticulturists, tasting room hosts, and growers will celebrate with more than two dozen local chefs in wine country cuisine, caterers, specialty food purveyors, to showcase the bounty of the unique Santa Barbara County agricultural paradise.

The 100+ members of the Vintners' Association will pour current wines, and have donated many large format bottle wines, special winery dinners, and gift-boxed verticals for a Silent Auction to benefit local charities. Local bands will entertain on Rancho Sisquoc's grassy slopes!

Celebration of Harvest is more than just the festival itself! Visitors can purchase a "Vintners' Visa" — a 4-day passport for tastings and special offers at more than 30 participating wineries — to take a leisurely drive on wine trails. Many wineries will host special events over the weekend. For complete details and tickets, visit the Santa Barbara County Vintners' Association website at www.SBCountyWines.com, or call the Association office at 805/688-0881.

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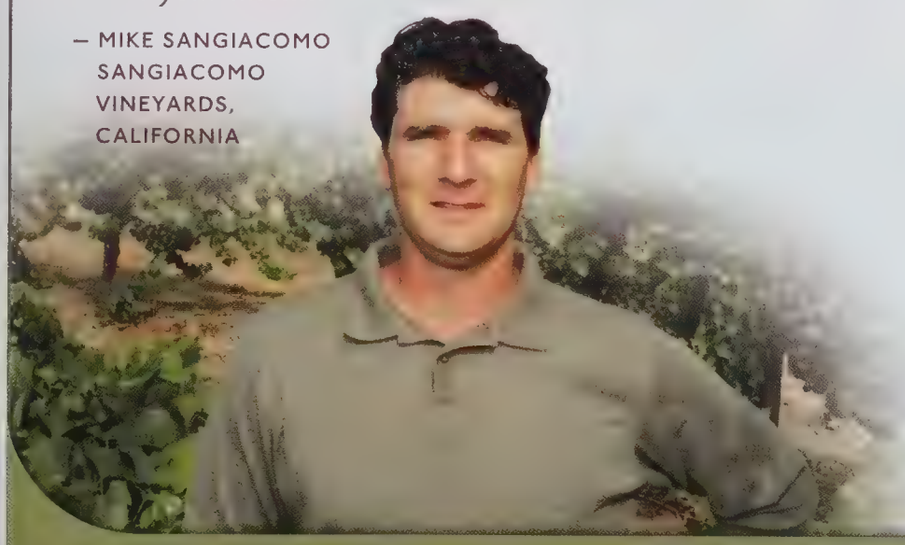

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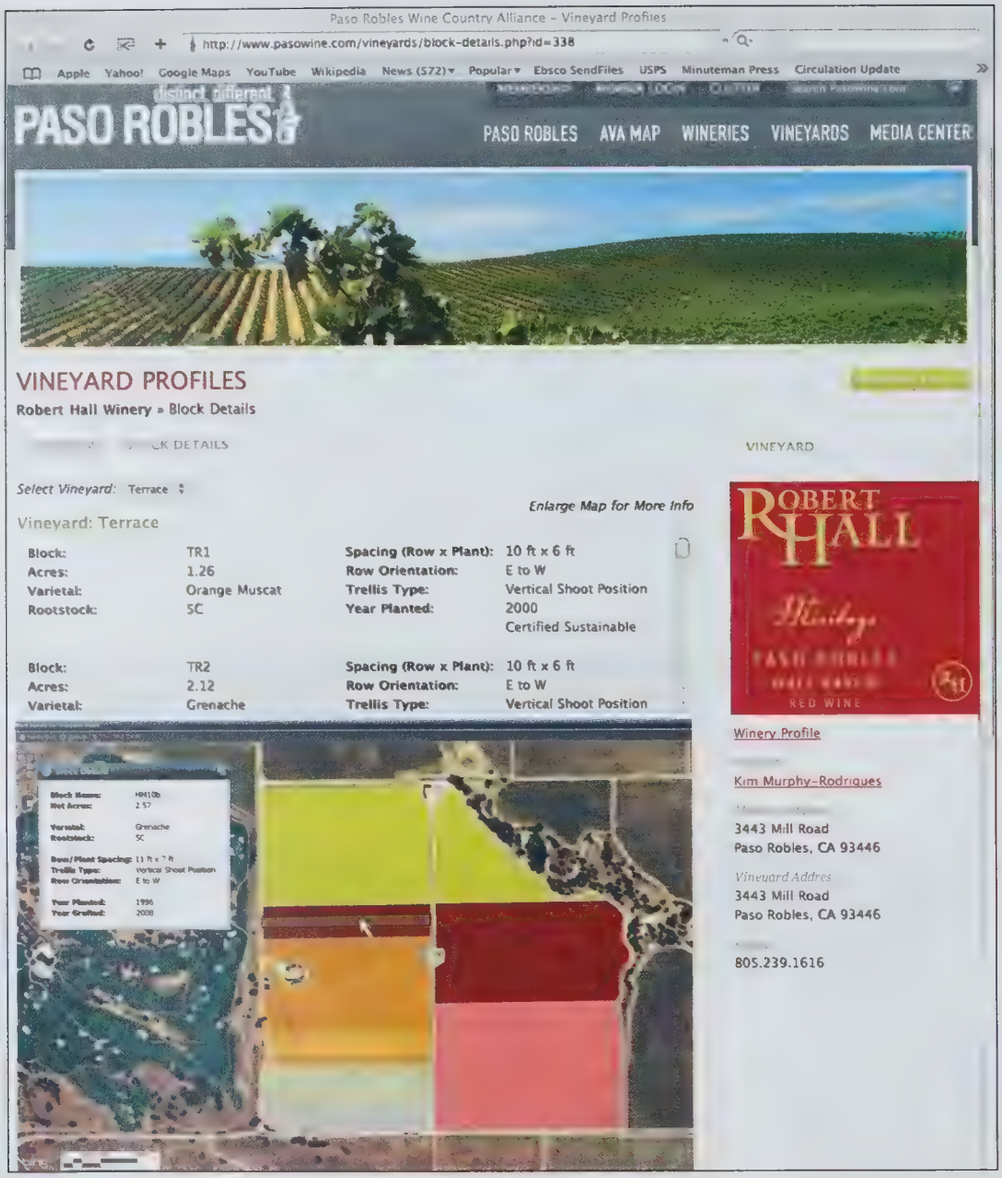

PASOWINE.COM

Improved website benefits wineries/growers

BY Tina Vierra

Paso Robles, on California's central coast, is one of the country's fastest-growing wine regions. In June 2009, the Paso Robles Wine Country Alliance (PRWCA) re-launched its website www.pasowine.com, featuring its members — more than 180 wineries, growers with 26,000 vineyard acres, and affiliated businesses.

The upgraded site is a marketing tool designed to encourage wine enthusiasts and members of the wine trade to seek information, plan a visit, and gain a better appreciation for the Paso Robles wine region.

Designer Thomas Reiss of Kraftwerk Design (San Luis Obispo, CA) gave the site its clean lines and fresh look. Clever Concepts (Paso Robles, CA) handled Web and database programming, content management, ensuring fast upload times, and positive search results.

User friendly

In its previous incarnation, Pasowine.com averaged 30,000 unique visitors per month, who spent 4.5 minutes per visit, and viewed more than five pages each visit. Visitor-tracking showed the most frequently-viewed content was winery information, travel to the region, business listings, and events. The refreshed site makes the most popular information more prominent, requiring fewer clicks to access it.

The retooled calendar feature appears near the top of the website's home page and shows color-coded days of the month with links to activities and a standardized format for listing events, which eases a user's search. Next to the calendar are individual upcoming events headlines, which visitors can click to go immediately to the event page for more information or to register.

A visitor planning navigation tool remains close-at-hand throughout the site, and a new footer tool bar remains consistent on every page. Each link in the footer tool bar provides single-click access to popular content within the website.

Aesthetically pleasing

Each month, more than 50% of visitors to Pasowine.com are new. The aim of the website designers and PRWCA was to create a meaningful, easy to use experience for new visitors to encourage them to return to the site. With action-buttons laid out in an intuitive manner and a balanced color scheme, the rejuvenated website is designed to retain interest.

New elements added to support user retention include RSS feed subscription; opt-in email notification, and video capabilities that bring another dimension to the site.

Mapping technology

Microsoft® Virtual Earth™ (renamed bing™ in May 2009), which is new technology for the Pasowine.com

site, allows a user to view detailed maps of the Paso Robles AVA, focusing on individual vineyards and their unique attributes. For the trade, the mapping offers precise block detail of vineyards that grow winegrapes specific to a need, or for background information on wines produced. For the wine enthusiast, the maps can satisfy curiosity about different grape varieties grown and the diversity of the region.

Mapping technology and vineyard data were provided and designed by Mike Bobbitt & Associates (Atascadero, CA), working with MoosePoint Technology (Sonoma, CA). MoosePoint provided the software platform and search tool. The mapping technology coupled with the rich vineyard data is unique to any regional wine association website, and an important asset to future revisions of Pasowine.com.

"The technology is one-of-a-kind," says Tim McGee, president of MoosePoint. "The vision was to create a user-friendly environment that would provide the most technical vineyard information while leveraging existing technologies for a cost-effective outcome."

The site has a also very powerful database component that lets wineries update their information themselves. The result will be a more up-to-date and constantly renewed site to better attract repeat users.

Christopher Taranto, PRWCA communications manager, will monitor visits and usage to track success of the new site.

Stacie Jacob, executive director of the PRWCA, says, "In addition to Pasowine.com being an excellent resource for wine enthusiasts and wine industry trade, the newly refreshed site allows the Paso Robles Wine Country Alliance to better serve our membership." ■

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Mixing software and Internet to reach customers

Logos provided to wineries by Inertia for use on their website, linked to their sales interface for trade accounts.

BY Tina Vierra

Potential for wineries to reach out direct-to-consumers (DTC) in the digital age has greatly expanded, although the realities are complex. In addition, since the *Granholm v. Heald* Supreme Court decision in 2005, direct-to-trade (DTT) possibilities are beginning to open up for wineries.

Inertia Beverage Group offered DTC content to wineries for the first time in 2003 — a combination of software applications that a winery can use on its own computer systems, and an Internet interface that allows wineries to connect directly with their customers and vice versa (what Inertia calls its "ReThink Engine"). The company has been constantly refining these tools ever since, using feedback from client wineries now numbering over 600.

Perhaps the most compelling facet of Inertia's business model, from a winery's perspective, is that other than initial set-up fees and nominal monthly web-hosting costs, Inertia gets paid by taking a small percentage of each bottle of wine sold using its tools. Transaction fees vary by which service package a winery uses, amounting to a maximum of $5 per $100 brought in through the platform.

"It is a win-win because a winery is only compensating Inertia for usage of the platform when sales are actively flowing through," says Andrea Johnston, VP of Channel Development at Inertia. "The more wine a client winery sells through the platform, the more income Inertia receives."

When Inertia had several hundred brands on its client list, and added personnel expertise in reaching consumers through the Internet, the company began building partnerships with specialized wine clubs, wine websites such as BoutiqueWineCellar.com and Winerevolution.com, and online wine events mixing and featuring various client wines. Consumers have a wide range of wine choices from more than 600 Inertia-client wineries, and the wineries hope to turn these casual consumers into loyal brand customers.

INERTIA BEVERAGE GROUP

Wine REvolution

PWV examined two small wineries whose savvy proprietors have figured out how to use tools that Inertia offers to build their sales and expand their customer bases, both consumer and trade.

Hagafen Cellars (Napa, CA)

Hagafen Cellars celebrated their 30th anniversary in 2008, having begun in 1979 when Ernie and Irit Weir made 25 cases of Pinot Noir Blanc. After custom crushing for 21 years, the Weirs built their winery in 2000, adding a tasting room in 2002. Hagafen now produces about 8,000 cases annually.

"For most of that time, we distributed wine only through distribution channels and the limited DTC available pre-Internet — mailers, phone calls, and a small wine club," says Josh Stein, Hagafen's brands manager. "When I was hired in 2003, our single club had about 150 club members. Since then, three wine clubs are up to about 1,000 members total, and we have an allocation list for several small-quantity release wines."

Hagafen produces a wide range of varieties: Chardonnay, Roussanne, Sauvignon Blanc, multiple Rieslings at different residual sugar levels, Late Harvest Chardonnay, Sauvignon Blanc, Rhône-style white blends, Cabernet Sauvignon, Cabernet Franc, Merlot, multiple Pinot Noirs, Syrah, Zinfandel, claret-style red table wines, and a Mélange Meritage blend.

SKUs are divided into three brands — Prix Vineyards (single-vineyard and lot-designated reserve releases available only DTC from the tasting room) and Premier Prix (wine club and allocation); the flagship Hagafen Cellars brand (distributed nationally and internationally); and the "fun" brand, Don Ernesto (in the tasting room and Napa Valley restaurants only).

"As a small producer, we believe in diversification so as to meet consumer and distributor needs wherever possible," Stein reports. "The same goes for our sales efforts.

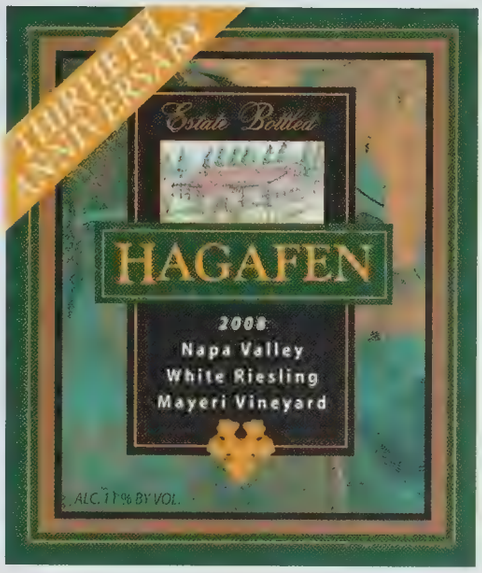
"The last six years have seen a considerable increase of our DTC sales, on the order of eight- to ten-fold. We outgrew the fairly simple database software we were using for the wine club, and the static web page and shopping software for online orders."

Hagafen wanted to unify club processing, online and allocation orders, and customer information management needs, and looked at both desktop-based and online solutions. They chose Inertia for the pricing structure, and for Inertia's ability to send thrice-

daily ftp data transfers to the winery's fulfillment partner, Copper Peak Logistics.

Hagafen's DTC online sales have increased ten- to twelve-fold since they converted to Inertia platforms in 2006, not including club re-orders. Hagafen moved from a web presence that had been proprietary to the winery (Stein wrote the web page and scripts and could completely remake the pages as needed), to a solution that is proprietary to Inertia, working within the Inertia systems and software updates.

"Our functionality is ultimately only as good as theirs. Their platform allowed us to expand from 150 to 1,000 club members, while tracking purchase histories and being able to offer on-the-fly discounting easily," Stein says. "We have seen club re-orders increase as a result of the ease of the system and the real-time tracking of shipments.



"There has been a learning curve for consumers and for us, inasmuch as there are only two people in the back office of the winery, and this kind of expanded web presence takes a lot of time to run right and keep going for sales growth."

Inertia had about 150 winery clients when Hagafen signed on, and Stein sees changes in terms of Inertia support to be more responsive to client needs. "Small wineries come to Inertia looking for unified solutions, and when issues come up, the fact that so much small winery business is in Inertia's hands means that their support and account people need to be in the loop, helping to resolve issues as quickly as possible."

Hagafen now aims to create more market space for its wines without losing their non-corporate method of making wine, and feels the pressure of doing business within increasing time pressures and personnel needs.

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world of social networking," Stein concludes, "and that is hard to do if you are trying to run as lean a business as possible."

Building a DTT interface that serves wineries and the trade

Inertia hopes to streamline the complicated interchange between wineries, wholesalers, and retailers, allowing winery clients to sell direct to restaurants and retailers in the same way they sell direct to consumers: legally, profitably, and in full compliance with state laws. The program allows retailers and restaurateurs to communicate directly, in real-time with their winery suppliers, speeding up the pace of business.

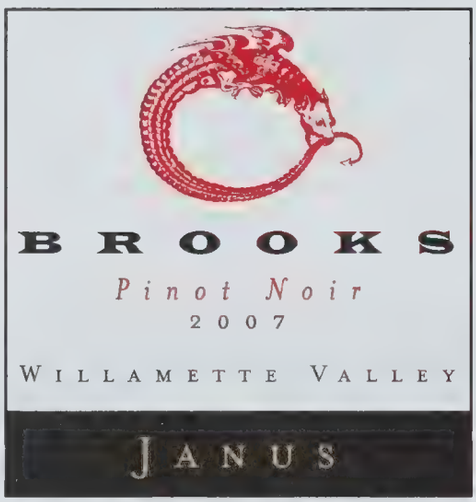
Key to the new system is the establishment of "virtual inventory." A restaurant or retailer places an order using a credit card through Inertia's winerevolution.com site (housing all wines sold through the system). The order is immediately routed through a designated wholesaler (in most states) who accesses the wine from the "virtual inventory" of the winery and is automatically billed by the winery. The wholesaler pays all taxes on the transaction, bills the restaurant or retailer, and then sends payment to the winery.

The entire transaction occurs instantly over the Internet. The winery then ships the wine to the retailer or restaurant consistent with their state or three-tier system delivery requirements. From the winery and restaurant/retailer's perspective, it feels just like a direct sale.

"All wineries in the program are generally small, artisan wineries that do not have traditional distribution in the given state," says Johnston. "The DTT program affords the creation of a more intimate connection between a producer, retailer, and restaurateur.

"It's a new way of thinking about wine sales that takes account of not only existing market dynamics, but also 21st century technology."

As of mid-2009, Inertia offers wines Direct-To-Trade in Arizona, California, Connecticut, Florida, Illinois, New York, Ohio, Oregon, Vermont, and Washington state, providing marketing support for the wineries with trade tastings in Arizona, California, and Florida.



Brooks Wines (Amity, OR)

Brooks Wines was founded by James ("Jimi") Brooks in 1998, fulfilling his dream of making affordable, high-quality Oregon Riesling and Pinot Noir. Brooks had made wines as an alternating proprietor at Maysara Winery (McMinnville) where he served as winemaker.

In 2004, Jimi Brooks died unexpectedly, leaving Brooks Wines owned by his son Pascal (now 13). Brooks' sister Janie Brooks-Heuck stepped in, with the help of several growers and winemakers in the Willamette Valley, to keep and grow Brooks Wines for the next generation. She has also managed to prove that, with the right tools and some good strategies, you can run a winery from almost anywhere.

Brooks-Heuck had new overhead costs to consider when Jimi Brooks died, because she had to move to custom crushing and hire a winemaker, and maintain Brooks' existing 10 grape contracts. She wanted to hold price points to Brooks' philosophy of affordable wines ($15, $18, and $25 whites; $18, $25, $35, and $50 Pinot Noir). She had to work out how to run the business end of the winery from her California home (though she has since acquired a home in Amity, OR and commutes back and forth).

"In 2004, we had six national distributors, and had just contracted with an Oregon broker," she reports. "We were only just getting a website developed, and we were moving about 3,000 cases per year."

In 2004 and 2005, Brooks-Heuck concentrated on getting the website and brand look up and running, using marketing consultant Lindsay Woodard (Lindsay Woodard Commuications, Napa, CA). By November 2005, Inertia had built, developed, and finalized the website, and became the winery's first platform for web and sales interface. Brooks-Heuck set a goal to build the winery's DTC business to 25%.

Brooks-Heuck launched the Equinox wine club in 2006. She developed and

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started sending a winery newsletter twice a year by snail mail. The website meant huge growth in Brooks Wines' customer base (the winery did not have a physical tasting room until Memorial Day 2008).

The Equinox wine club has 75 members, and Brooks-Heuck expects the tasting room to grow that significantly. The electronic mailing list is 1,100 members, who click directly to the website to buy wines, and the postal mailing list has 1,500 members.

"Our fulfillment house is in Oregon; Inertia's club and sales interface sends notification, collects changes, processes credit cards, and produces all fulfillment data for the shipper," Brooks-Heuck reports. "It also generates compliance paperwork as needed."

The Amity tasting room is open by appointment and weekends during the summer. In the first summer there were 50 tour groups (by appointment). Memorial Day and Thanksgiving Day weekends in 2008 saw over 400 visitors. Tasting room customer information gets entered into Inertia databases after visitors leave.

The winery rarely donates wine to charitable causes; instead it donates tastings because Brooks Wines values personal contact with its customers. Brooks-Heuck reports this gets up to 20 people into a room, tasting and buying Brooks wines, and nearly always nets new wine club sign-ups. "Events create the personal relationship that is at the heart of the Brooks philosophy. There is nothing better than watching someone enjoy your wine and getting to talk with them about it." Brooks-Heuck often handwrites notes to her customers.

Brooks-Heuck started concentrating on building DTT business in the summer of 2007. Brooks Wines had an Oregon wholesaler that it inherited in 2004, and still had only nine national distributors. Because Brooks Wines' business was 99.9% distributor, the winery's margins were poor. Brooks-Heuck began using Inertia DTT tools with a goal of raising the DTT business by 10% to 15% with better margins.

The winery's DTT business was up 5% by the third quarter of 2008, all through Inertia's DTT efforts. Brooks wines have found placement in two Florida restaurants and with several online retailers, and secured sales in southern California.

Brooks-Heuck reports improved margins with both DTC and DTT sales. "In the first quarter of 2009, direct-to-trade accounted for 7% of case sales and 9% of our income. DTC was 9% of case sales and 17% of our income (DTT pricing is an average 110% of the price we receive from distributors)."

"Inertia's whole corporate blogging effort (blog.inertiabev.com) that shares best practices and occasionally features clients, was a surprise success in building our online retail relationships," Brooks-Heuck says.

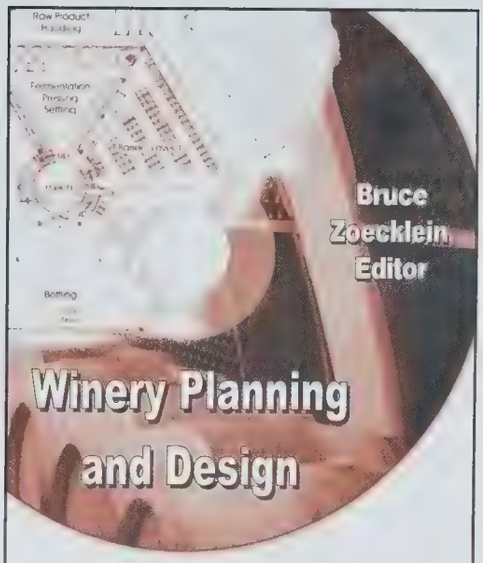
Brooks-Heuck plans to visit potential markets in 2009, and start building relationships in the trade, using Inertia's interface to fulfill new orders. Southern California and Arizona will be focus markets for sales. The winery is now producing about 8,000 cases per year.

"2008 was all about putting the rest of our foundation together — establishing our own winery facility in the Eola Hills, opening the Amity tasting room, and continuing to build business systems to expand sales," she explains. "Chris Williams, who was Jimi's assistant at Maysara, has been our full-time winemaker since 2005. Now I feel like I can concentrate on growing sales, and I have my tools in place to do it."

She plans to work in the markets with her distributors, and to do more winemaker dinners. She also plans to invite Inertia DTT database potential customers to "bring a friend and meet the winemaker" and work on building relationships.

"Having the right distributors to sell to the right retailers and restaurants makes a huge difference in our resulting clientele. At our size, it is all about the hand-sell."

Quarterly, Brooks-Heuck calls her Inertia account manager, discussing eblasts and other upcoming strategies. She likes that Inertia brings all client successes to every discussion with Brooks Wines, to see what will work for them. With more than a few good ideas of her own, she has hit the road in 2009 and will see how much farther she can grow the winery's sales. ■



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BOOK EXCERPT

From Demon to Darling

Continued from page 48

Liquor has been a divisive and controversial issue during most periods of American history. Little wonder that we have no national drinking standard and that local option has had, and continues to have, great appeal. The majority decision in a local option election reflects the community's values, which are encoded in law; the smaller the voting unit, the better the reflection.

Although this democratic approach seems rational, the results are not. Local option subjects the minority to the will of the majority in a matter of personal and social conduct. Tolerance should prevail over winners and losers. Majority rule is also ineffective. Drinkers will find a way to drink, no matter how severe the prohibition. The "iron law of prohibition" teaches that the harsher the law, the more likely it is that the drinker will turn to stronger alcoholic beverages.

Throughout American history, drinking has been associated with lawlessness. The vices, which are multifaceted, include public drunkenness, smuggling, bootlegging, adulteration, misbranding, gambling, prostitution, and underage drinking. In the 1970s, Selden Bacon, the former director of the Center of Alcohol Studies at Rutgers University, summarized Americans' approaches to these problems.

> This complex set of problems over the past 150 years has been defined as a moral weakness problem and turned over to the churches, defined as an economic problem and turned over to market and price-control authorities, defined as a youth learning problem and turned over to educators, defined as a crime problem and turned over to law enforcement and correction agencies.[3]

After Repeal, the state and federal governments were determined to eliminate the excesses of Prohibition through liquor "control." To achieve an orderly liquor market and reduce alcohol consumption, most states intervened directly in the market. They adopted laws — many of which remain in effect today — that were anti-competitive, protectionist, and out of touch with the changing economic, social, and cultural conditions in the country. This led to a widespread belief in the liquor industry and among consumers that the laws were obtuse and arcane.

Historically, the Supreme Court has done as much to promote trade in wine in America as have the wine industry or consumers. In the nineteenth century, the court slowed the march to statewide and later national prohibition by insisting on free trade in interstate and foreign commerce. The court required Congress, acting under its Commerce Clause authority, to resolve legislatively the inherent conflict between prohibition and free trade.

Congress chose not to do so but instead deferred to the states. Each state was allowed to develop and impose its own liquor laws to govern the delivery and use of alcoholic beverages within that state's borders. It was essentially local option for the states, adopted at the federal level.

After Repeal, and following the Brandeis years during which Louis Brandeis served on the Supreme Court (1916–1939), the court proved willing once again to examine whether the states' liquor laws are consistent with the Commerce Clause and other parts of the Constitution. The court also considered whether or not those laws truly serve the core interests and clear concerns of the Twenty-first Amendment. After this scrutiny, the court struck down many state laws, including those that legislate price controls, price advertising bans, discriminatory taxes, and protectionist shipping laws, to cite but a few examples.

The Supreme Court cannot, however, secure wine's place in American culture and society. To accomplish that, leadership and vision are critical. Throughout American history, such visionaries as Thomas Jefferson, Nicholas Longworth, and Rexford Tugwell have had surprisingly consistent objectives. Robert Mondavi, our generation's wine visionary, set lofty goals for the domestic wine industry after Repeal — to make world-class table wines and to associate those wines with the land, food, and the arts.

In the end, wine — demon or darling — represents a battle for the hearts and minds of American consumers. After Repeal, the European immigrants who sought to revive the domestic wine industry and establish an American wine culture, at a time when the prospects for either seemed remote, accepted on faith — faith in their families and their heritage — that wine was healthy. They never shied away from the research necessary to prove it. Of course, healthy does not mean risk-free.

But there are many indications today that moderate wine consumption is healthy for the majority of Americans. The old winemakers had it right when they encouraged the federal government to change the name of dry wines to table wines. The association and the pairing of wine with food cannot be underestimated from the perspective of marketing or health.

If an authentic wine culture is to take root in America, the wine industry must accept the responsibility not only to communicate about their vineyards and wines and the attributes of each, but also to educate drinkers and nondrinkers about wine's role in a healthy lifestyle, its place in a civilized society, and the risks of intemperance. The wine industry has had to be resilient to survive and prosper. The future will require commitment, intelligence, and patience. ■

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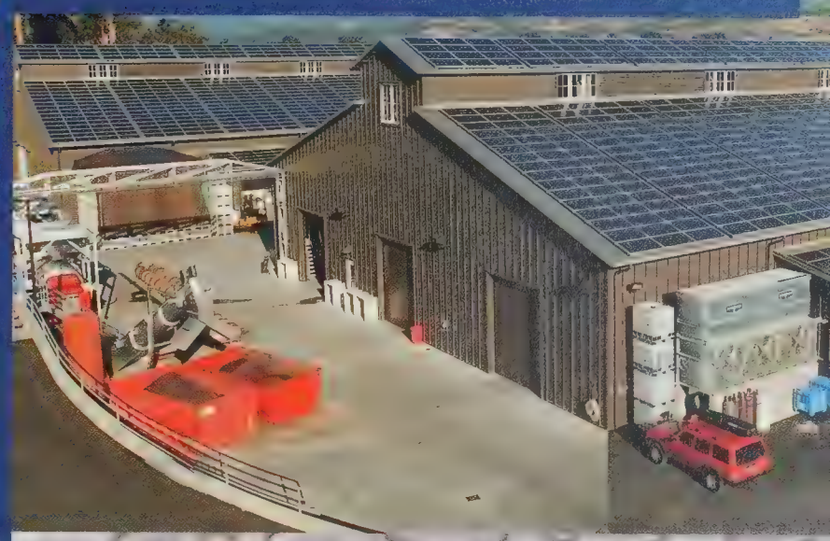

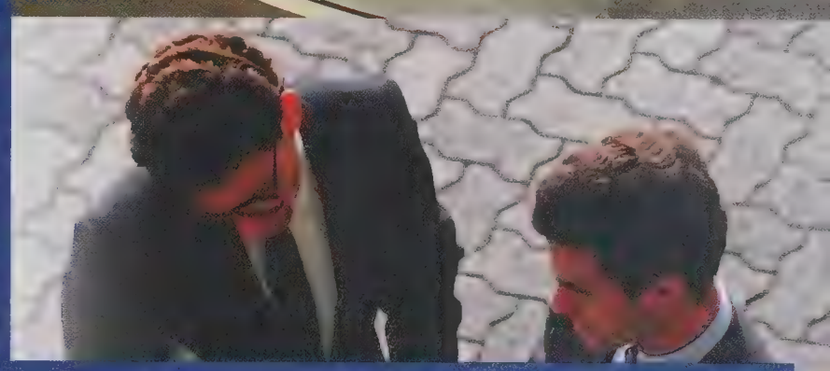

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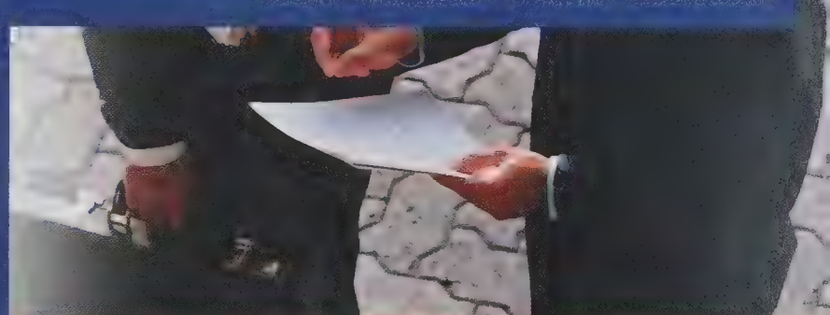

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e-mail: strobeltt@msn.com
website: www.breckenridgesoftware.com

PLEASE SEE BRECKENRIDGE AD, PAGE 65.

Pacific Gas & Electric Company (PG&E)

Pacific Gas and Electric Company helps wineries find energy-efficient solutions that are cost-effective and can support the sector's increasing environmental goals. To this end, the program partners with industry, trade allies, energy consultants, and others to promote integrated energy management solutions that can include energy efficiency, water efficiency, self-generation, and demand response opportunities.

Services include:
- Facility audits and system assessments;
- Subsidized tests for irrigation pumps;
- Rebates, incentives, and design assistance for new construction projects;
- Rebates, incentives, and calculation assistance for retrofit projects;
- Benchmarking tools for wineries and refrigerated warehouses;
- Emerging technology research and demonstration;
- Education through relevant industry and technology workshops and training.

For more information, contact:
Pacific Gas & Electric Company (PG&E)
Business Customer Svc. Ctr.: 800/468-4743
website: www.pge.com/wineries

PLEASE SEE PG&E AD, PAGE 5.

Vinotec Napa

Lisa Van de Water founded The Wine Lab in 1975 (but is no longer involved), Pacific Rim Oenology in New Zealand in 1992, and since 2003, has operated Vinotec Napa. She collaborates with consultants internationally, promoting information exchange and technology transfer to raise wine quality.

Vinotec Napa looks at wine as a whole, not just as numbers, interpreting what lab results mean, diagnosing and solving winemaking problems, and making practical suggestions to improve winery procedures.

At Vinotec Napa, management of wine microbes — good and bad — is a prime concern that includes avoiding stuck ferments, *Brettanomyces*, *Lactobacillus*, *Pediococcus* and other undesirables, so Lisa is often called "The Bad Wine Lady." Combining traditional culturing and microscopy with PCR gives the most useful and cost-effective results for microbe testing and identification. Projects include locating unusual *Brettanomyces* strains, wine contaminants that may cross-react with PCR primers for wine microbes, and spoilage *Lactobacilli* that are not detected by current genetic techniques.

Seminars and workshops on fermentation and wine microbiology, and in-house training sessions on microbe identification, are held for wineries in several countries.

In March 2009, Vinotec Napa became the U.S. wine industry distributor for Megazyme enzymatic test kits (www.megazyme.com).

Vinotec Napa formulates fermentation nutrients, including the new Superferm, designed for high-risk fermentations. Free technical support is provided for Superfood®, Startup, Vinferm, Vitamix®, Supervit®, and Leucofood, supplied by Beverage Supply Group, www.bsgwine.com, 800/585-5562.

For more information, contact:
Vinotec Napa
Lisa Van de Water
607 Cabot Way, Napa, CA 94559
technical: 707/953-7072
fax: 707/224-4028
e-mail: badwinelady@aol.com
website: www.vinotecnapa.com
International Afflilates:
Chile: www.vinotec.com *(en español)*
New Zealand: info@pros.co.nz
South Africa: www.vinlab.com

PLEASE SEE VINOTEC ADS, PAGES 22, 40.

Lescure Engineers, Inc.

Is Zero Carbon Energy an achievable goal for a large winery operation? Lescure Engineers, along with the other members of the DesignSmart Group, is in the process of transforming these ambitious goals into reality for a large Sonoma County winery. The project will develop and implement a site-specific, integrated energy efficiency program, including refrigeration, hot water, green building improvements, solar thermal and solar photovoltaics.

LESCURE ENGINEERS, INC.

Engineering for Sustainability

Lescure Engineers has successfully secured a Use Permit to double wine production to three million cases per year at this Sonoma County facility without expanding the winery process wastewater system. Engineers are working on a zero water discharge strategy to eliminate the wastewater pond entirely.

Lescure Engineers has a reputation for innovation dating back to 1979. The new Environmental Resources Engineering services start with an Investment Grade Energy Audit, designed to help decision-makers determine life-cycle costs and savings. Lescure can assist with various types of public and private financing available for energy and water efficiency upgrades. Services extend through engineering and permitting, construction administration and observation, commissioning, training and operations support.

Visit www.lescure-engineers.com to learn more about Lescure Engineers and the DesignSmart Group.

For more information, contact:
Lescure Engineers, Inc.
4635 Old Redwood Hwy.
Santa Rosa, CA 95403
tel: 707/575-3427; fax: 707/542-2353
e-mail: le@lescure-engineers.com
website: www.lescure-engineers.com

Yokayo Wine Company

Yokayo Wine Company is one of the newest custom crush facilities in the industry. Conveniently located on West Lake Mendocino Drive just off Highway 101 in Ukiah, CA, it provides easy access for trucks or tankers of any size.

The facility has a crush capacity of 500 tons of grapes per day. Customers may take advantage of the comprehensive winemaking program, or provide a set of winemaking protocols for Yokayo to follow. Yokayo Wine Company has an on-site laboratory and blending room for scientific and sensory analysis, and full-size truck scale for easy in-and-out certified weights.

All tanks are equipped with cooling jackets, and come in a wide variety of sizes from 1,000 gallons to 30,000 gallons. Total tank capacity is 2.3 million gallons. Insulated tanks are available for long-term storage.

For more information, please contact:
Yokayo Wine Company
David Rosenthal
301 West Lake Mendocino Dr., Ukiah, CA 95482
tel: 707/463-3366; fax: 707/463-3356
e-mail: info@yokayowineco.com
website: www.yokayowineco.com

SolarCraft

SolarCraft has earned a reputation as "Solar Energy Experts" by providing excellent solar electric contracting and solar thermal systems for wineries, residences, other businesses, and government projects since 1984. SolarCraft has installed nearly 4,300 solar energy systems, totaling over 1.5 million square feet of solar collector surface, and saving customers over $8 million in annual energy costs, and eliminating more than 28,000 tons of greenhouse gas every year.

SolarCraft's notable projects include: Sterling Vineyards (Calistoga); Jacuzzi Vineyards (Sonoma); Cline Cellars (Sonoma); Merryvale Vineyards/Starmont (Napa); Wellington Vineyards (Glen Ellen); Trione Vineyards (Alexander Valley); Fountaingrove Golf & Athletic Club (Santa Rosa); Marin Builder's Association (San Rafael); and Geyserville Fire Station.

In 2009, SolarCraft celebrates 25 Years providing solar thermal and solar electric consulting, design, sales, installation, and maintenance services, and is a certified "Green Business."

SolarCraft's knowledgeable and experienced representatives are available to provide a complete assessment of energy requirements, and can provide a complete solution to meet winery needs. A FREE on-site consultation includes PV design and wattage recommendations that are tailored to winery requirements. All the paperwork is handled to maximize current rebates and tax incentives, and a variety of financing packages are offered.

For more information, contact:
SolarCraft
285-D Bel Marin Keys Blvd.
Novato, CA 94949
tel: 415/382-7717, ext. 26; fax: 415/382-0592
e-mail kburnett@solarcraft.com
website: www.solarcraft.com

VA Filtration USA

VA Filtration USA is a mobile service company specializing in the removal of volatile acidity (VA), *brettanomyces* (4EP/4EG), and smoke taint from wine, and offers wine filtration services, pH correction, TCA/TBA removal, and concentration of wine using ultrafiltration membrane elements. VA Filtration offers alcohol reduction service at its DSP facility.

VA Filtration offers the SWEETSPOTTER single barrel membrane system for trialing VA reduction, 4EP/4EG reduction, and smoke taint removal. The SWEETSPOTTER can also be used as a stand-alone treatment device for small wine lots. More than 250 winemakers have used the SWEETSPOTTER.

In 2009, VA Filtration made a breakthrough development in removal of smoke taint. The DETOX system involves the movement of wine from the bottom of the tank, through a resin media, and back into the top of the tank using a minimum of pressure. DETOX can be used on its own for less tainted wines, or in combination with a membrane-based smoke taint removal process. The DETOX and membrane-based processes are successful in treating highly contaminated smoky wine with almost no residual taint detection. The common "return" of smoke taint after processing is completely eliminated when the DETOX process is used.

VA Filtration USA and its partners in Australia, South Africa, and Chile are continually finding new and improved ways of dealing with taint issues. With careful pressure management and less "handling" of the wine overall, VA Filtration strives to provide gentle and efficient wine filtration.

For more information, contact:
VA Filtration USA
Bryan Tudhope
tel: 800/577-1220; fax: 707/552-3871
e-mail: bryan@vafiltration.com
website: www.vafiltration.com
PLEASE SEE VA FILTRATION AD, PAGE 50.

Taylor Lombardo Architects

Taylor Lombardo Architects is an award-winning architecture and master planning firm with offices in San Francisco and Napa, CA.

The firm offers a full range of services, from initial conceptual design and programming, through construction administration and project management. With extensive experience developing custom residential, commercial and winery projects, the firm is committed to delivering the highest level of professional service.

- Partnership: Dedicated to helping winery owners realize their vision.
- Success: A history of developing world-class wineries has established Taylor Lombardo Architects as a reliable partner in the industry.
- Experience: Completion of numerous projects has developed a thorough understanding of the process and operational needs of a winery.
- Strategy: A comprehensive approach to the employee, operator, and guest experience ensures efficiency.

The philosophy for partners Tom Taylor and Maurice Lombardo is that each project is unique and by developing a strong working relationship, each project can be true to the client's desires. Both partners are involved in all aspects of every project and remain the first point of contact throughout planning and construction. The staff consists of highly talented and experienced architects, designers, project managers, and CAD drafters.

For more information, contact:
Taylor Lombardo Architects
529 Commercial St., Ste. 400
San Francisco, CA 94111
tel: 415/433-7777
e-mail: info@taylorlombardo.com
website: www.taylorlombardo.com
PLEASE SEE TAYLOR LOMBARDO ARCHITECTS AD, PAGE 8.

TEP Engineering

TEP Engineering provides a full range of mechanical engineering services including heating, ventilation, air conditioning, refrigeration, process piping, plumbing and control systems design. Additional services include energy studies, Title 24 energy compliance calculations, and LEED work. TEP Engineering's recent work includes one LEED-certified winery, and two others pending LEED certification.

TEP Engineering provides innovative and functional mechanical designs within the framework of project requirements. Every project has a unique blend of cost, energy, environmental, aesthetics, space, and technical considerations. TEP Engineering endeavors to consider all of these factors in creating the most appropriate mechanical design.

TEP ENGINEERING

TEP Engineering has been involved in pioneering unique and energy-efficient mechanical designs, such as hydronic radiant cooling for wineries, water source heat pumps coupled to lakes, GeoExchange heat pump systems, advanced heat recovery systems, and indirect-direct evaporative cooling systems. As energy prices have soared, TEP Engineering has found new approaches to reduce energy consumption, optimize energy use, and minimize the environmental impact of mechanical systems.

TEP Engineering's staff includes two LEED-AP certified engineers, in addition to engineers and designers with more than 60 years of HVAC and plumbing contracting experience. Please visit www.tep.net for further information.

For more information, contact:
TEP Engineering
880 Second St., Santa Rosa, CA 95404
tel: 707/538-0400 ext.1; fax: 707/538-0406
e-mail: rob@tep.net
website: www.tep.net

PLEASE SEE TEP ENGINEERING AD, PAGE 18.

Cork Quality Council

The Cork Quality Council (CQC) is a nonprofit organization established to promote and improve quality assurance procedures for the wine and cork industries. The eight current members are: Amorim Cork America, Cork Supply USA, Ganau America, Juvenal Direct, Lafitte Cork & Capsule, M.A. Silva Corks USA, Portocork America, and Scott Laboratories.

CORK QUALITY COUNCIL

All CQC members adhere to stringent standards dedicated to improving quality. These standards have helped CQC members to significantly reduce the incidence of cork taint in their inventories. The CQC conducts annual audits to verify that all approved quality control protocols are observed.

The foremost quality control measure is based on a chemical screening method for TCA, developed by ETS Laboratories under CQC sponsorship. This analytical method is now widely used throughout the U.S., Europe, and Australia by wineries and cork suppliers. Other audited CQC procedures include moisture levels, physical integrity, residual oxidants, and maintenance of documentation.

For more information, contact:
Cork Quality Council
11160 Terrace Dr., Forestville, CA 95436
tel: 707/887-0141
e-mail: info@corkqc.com
website: www.corkqc.com

Hansel Leasing, Inc.

For more than 45 years, Hansel Leasing has been the premier source for leasing. Hansel Leasing continues as a full-service leasing company; providing leases for new and used vehicles and equipment. Every lease is customized to suit the specific needs of the client.

HANSEL LEASING

We Lease Everything!

Hansel Leasing knows the wine business. With hands-on winery experience, Hansel Leasing is the expert leasing source for the wine industry.

As a direct lender, Hansel Leasing's professionals are able to make credit decisions, create documents, and pay vendors in a timely manner. The primary goal is to make every transaction simple and convenient for wineries and their suppliers.

Hansel Leasing can provide lease financing for any winery including crushers, presses, bottling lines, stainless steel tanks, oak wine barrels, refrigeration systems, barrel racks, vineyard wind machines, sorting tables, forklifts, tractors, seeders, and sprayers. Additionally, Hansel Leasing can take the hassle out of buying or leasing any make or model of vehicle.

Contact Hansel Leasing — they lease everything!

For more information, contact:
Hansel Leasing, Inc.
Jim Taylor, Lease Manager
PO Box 3437, Santa Rosa, CA 95402
tel: 707/544-2822; fax: 707/578-8306
e-mail: jtaylor@hanselleasing.com

PLEASE SEE HANSEL LEASING AD, PAGE 36.

MH Architects

MH Architects offers a wide range of technical experience in winery programming and design. Working closely with winemakers, the firm helps create the optimal facility for specific production requirements.

Whether the project involves new construction or renovation of an existing building, certain objectives remain constant. Operation layout should allow the winemaker flexibility to make adjustments in processing strategy during the life of the building.

When room organization is integrated with proper plumbing, mechanical, and refrigeration design, the winemaker enjoys a high level of temperature, humidity, and ventilation control. Production spaces with the ability to switch from one function to another from harvest to bottling hold a greater performance value.

MH ARCHITECTS

MH Architects provides project management in the coordination of engineers and design-build consultants involved in a particular project. From schematic design to construction administration, building systems efficiently weave together to save construction costs, and create a highly functional winery facility.

For more information, contact:
MH Architects
Matt Hollis, AIA, LEED AP
650 5th St., Ste 504, San Francisco, CA 94107
tel: 415/977-0194; fax: 415/977-0196
e-mail: matt@matthollis.com
website: www.matthollis.com

Winesecrets

Winesecrets provides North American wineries with new, eco-friendly, mobile, and in-house wine technologies on demand, answering the challenges of brand consistency, stylistic integrity, and most important, environmental sustainability. Winesecrets is a partner in progressive wine craft today, and is a valuable resource for tomorrow's priorities.

Winesecrets
Technologies for a Sustainable Future

Winesecrets services include:
- STARS tartrate stabilization and pH reduction;
- Alcohol adjustment/flavor balance;
- Volatile acidity and ethyl acetate reduction;
- Smoke and taint removal, 4-EG/4-EP reduction;
- Wine and must concentration;
- Wine clarification;
- Tannin refinement.

Services are available throughout California and most of North America, and include a range of filtration technologies such as volatile acidity reduction, alcohol adjustment, smoke and *brettanomyces* taint removal via reverse osmosis, tartaric stabilization and pH reduction using STARS, cross-flow filtration, and ultra filtration.

Winesecrets provides services from Napa, Sebastopol, and Paso Robles, CA; Dundee, OR; Richmond, WA; Penticton, B.C. Canada, and Niagara-on-the-Lake, Ontario, Canada.

For more information, contact:
Winesecrets
tel: 707/824-2022 or toll-free: 888/656-5553
e-mail: domingo@winesecrets.com
website: www.winesecrets.com
PLEASE SEE WINESECRETS AD, PAGE 36.

Akeena Solar

Improve a vineyard's sustainability — and cash flow — with a solar electric system. Solar power benefits the environment by providing electricity produced from a clean, renewable resource.

The V. Sattui Winery project in St. Helena is a recent addition to Akeena Solar's growing list of farsighted winery customers who produce free electricity while, at the same time, protecting the environment. Other installations completed in the wine industry include: Lafitte Cork & Capsule, Silver Mountain Winery, Peay Vinyards, Topel Winery, Guenoc Winery, Clos Pegase, Von Strasser Winery, Cloudview Vineyards, Belvedere Winery, Rudd Winery, Mount Eden Vineyards, Cooper-Garrod Vineyards, Hagafen Cellars, Paloma Vineyards, Kent Rasmussen Winery, and Peju Winery.

Akeena Solar

Sustainability has become a vital focus for family-owned wineries in California. Solar electric power allows wineries to control one of the more expensive and typically unpredictable components of operating a winery: electric rates.

36 kilowatt case study: V. Sattui Winery

Total installation cost	$273,000
30% Federal Tax Credit	–$57,001
Renewable buydown rebate	–$82,997
Net Cost:	**$133,002**
Depreciation Tax Benefit (MACRS):	**$55,861**

PV System financial benefits

First year energy savings	$6,771
Total energy savings (30 yr life)	$581,184
Locked in Net Cost/kWh (30 yr life)	$0.0904
Rate of Return:	**14.5%**

Akeena provides complete turnkey vineyard solar installations for wineries throughout Northern California. Call for a free site survey and financial report. Rebate funding and tax credits are limited.

For more information, contact:
Akeena Solar
16005 Los Gatos Blvd., Los Gatos, CA 95032
tel: 888/253-3628; fax: 408/395-7979
e-mail: info@akeena.net
website: www.akeena.net
PLEASE SEE AKEENA SOLAR AD, PAGE 60.

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San Rafael, CA 94912-9830

PRACTICAL WINERY & VINEYARD

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PWV BOOKSHELF

USE THE BOOK ORDER FORM IN THIS ISSUE

Our wine books promptly shipped from one source.

A Zinfandel Odyssey
Rhoda Stewart
100 interviews with Zinfandel and producers throughout California and Mexico. Edited and published by ***PWV***. **450pp—$40**

COOL CLIMATE BOOKS

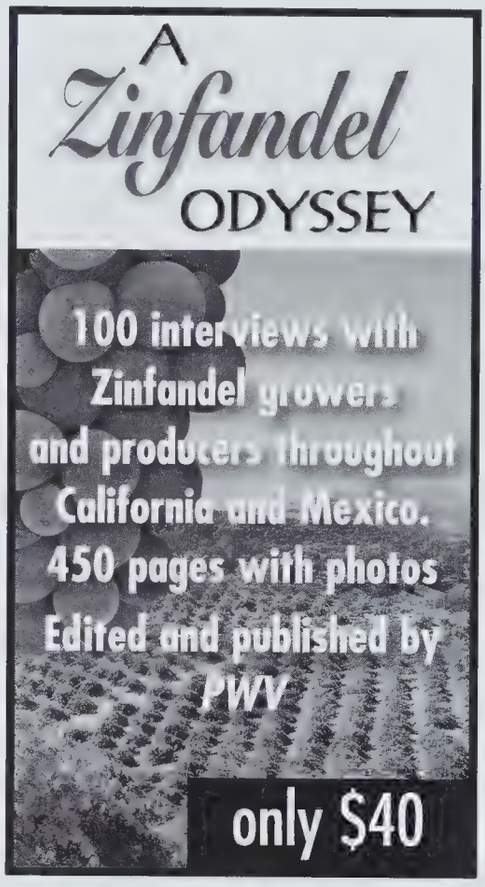
Production of Grapes and Wine in Cool Climates
David Jackson, Lincoln University, New Zealand and Danny Schuster, NZ vintner
The definitive work in English on cool climate viticultural practices, first printed 1981. Latest updated printing, 2007. Includes major world cool climate regions, all aspects of vineyard establishment and practices, and winemaking from cool climate grapes
193pp—$55

Monographs in Cool Climate Viticulture I: Pruning and Training
David Jackson, Lincoln University, New Zealand
New approaches to analysis and interpretation of pruning and training that apply to specific benefits and challenges of cool climates.
169pp—$30

Monographs in Cool Climate Viticulture II: Climate
David Jackson, Lincoln University, New Zealand
Importance of climate for growing grapes and producing wine in cool temperatures, and how growers can avoid potential problems. Topics include world climates and global warming, vineyard establishment in cool climates, and wine styles. **80pp—$35**

Diseases and Pests
Nicholas, Margarey, Watchel
Dept. of Primary Industries & Resources, South Australia. **106pp—$40**

Diseases, Pests, & Grape Disorders Field Guide
Magarey, MacGregor, Wachtel, & Kelly
Sturdy, laminated, pocket-sized guide containing more than 350 color photos with short, easily-read descriptions of most diseases, pests, and disorders found in vineyards. **107pp—$30**



Illustrated Guide to Microbes and Sediments in Wine, Beer and Juice
Dr. Charles G. Edwards
125 color photographs showing over 30 different species of yeast, bacteria and mold commonly found in wines, as well as frequently encountered sediments.
126pp—$125

Micro Vinification
M.R. Dharmadhikari & K.L. Wilker
A practical guide for home winemakers, commercial small-scale producers, and large wineries making small, experimental lots of table wine. **120pp—$36**

Paso Robles: An American Terroir
Thomas J. Rice, Ph.D. and Tracy G. Cervellone, C.W.E.
Natural and viticultural history of the Paso Robles AVA, including winery profiles, environment, geology, soils and climatic conditions.
172pp—$50

Sunlight into Wine
R. Smart & M. Robinson
Canopy management and economics, improvement of canopy microclimates, importance of winegrape canopies, construction of trellis systems. **88pp—$40**

Vineyard Simple
Tom Powers
Provides a clear outline with diagrams and color photos on how to build and maintain your own vineyard. **118pp—$20**

Winery Planning & Design CD, Edition 16
Bruce Zoecklein
Expanded edition is unique book on CD outlining winery planning and design: including many winery blueprints, "green building," sustainable planning, and business planning.
Over 1,500pp outline—$110

TECHNIQUES & CONCEPTS SERIES

A series of lab books in an easy-to-use format for wineries.

Chemical Analysis of Grapes and Wine: Techniques and Concepts
P. Iland, N. Bruer, G. Edwards, S. Weeks, & E. Wilkes
Comprehensive theory and practice of major chemical analyses of grape and wine.
120pp—$120

Monitoring the Winemaking Process from Grapes to Wine: Techniques and Concepts
P. Iland, N. Bruer, A. Ewart, A. Markides & J. Sitters
Concepts, tests and techniques used by winemakers throughout the winemaking process for wine style and quality control. **115pp—$120**

Microbiological Analysis of Grapes and Wine: Techniques and Concepts
P. Iland, P. Grbin, M. Grinbergs, L. Schmidtke, & A. Soden
An introduction to microbiology in winemaking; serves as a resource for lab personnel and winemakers. **125pp—$120**

Premier Power Renewable Energy, Inc.

Premier Power Renewable Energy, Inc. (ticker symbol: PPRW) is a leading provider of solar power systems with consistently high quality and performance for winery and vineyard customers. Premier Power combines technical and financial expertise in a range of structures, with transparency and innovation that exceed the expectations of customers.

Premier Power's rapid growth and profitability is virtually unparalleled in the solar industry. This success is attributed to its experienced employees, history of innovation, conservative construction management, and quality control standards.

Premier Power is dedicated to delivering innovative, efficient, and reliable solar power systems through its engineering, procurement, and construction (EPC) process. Most importantly, Premier Power is focused on delighting its customers.

Premier Power helps wineries make an informed decision about which type of solar system is right for their business, and take full advantage of the many financial incentives available.

When it came to solar, these wineries and vineyards chose Premier Power: Van Ruiten Family Winery, Chappellet Winery, Trinchero Family Estate, Shafer Vineyards, Chateau Montelena, Spottswoode Estate Vineyard & Winery, Silverado Vineyards, Larkmead Vineyards, Madrona Vineyards, Terre Rouge Wines, and L'Aventure.

For more information, contact:
Premier Power Renewable Energy, Inc.
4961 Windplay Dr., #100
El Dorado Hills, CA 95762
tel: 877/939-0400
e-mail: info@premierpower.com
website: www.premierpower.com

Complí, Inc.

Complí has serviced a long list of clients, including more than 600 wineries, importers, distilleries, breweries, wholesalers, and importers since its establishment in 1997.

Clients turn over daily compliance tasks to Complí, secure in the knowledge that they will be handled in a professional and timely manner. Complí handles **full service compliance** administration, taking care of everything from TTB permits to direct shipper licenses, price-posting, product registrations, and more. Complí also specializes in large national licensing projects resulting from mergers and acquisitions.

Complí offers a variety of web-based tools, including **eComplí**, the only comprehensive enterprise solution that handles all alcoholic beverage compliance needs. This web-based software is used by multiple organizations, including enterprise clients with in-house compliance departments, small wineries with licenses to obtain and renew, and importers of all sizes.

Complí℠
BEVERAGE INDUSTRY COMPLIANCE

New in 2009: Complí has launched a new, self-service, direct shipper licensing website: *Licensing On Demand*. This low-cost, help-yourself model allows any winery to complete winery-direct shipper license applications, including required certificates and tax permits.

Whether a winery has been managing its own compliance for years or is just bottling its first vintage, Complí offers an efficient, customizable solution to help wineries cut the red tape.

For more information, contact:
Complí, Inc.
8834 Morro Rd., Atascadero, CA 93422
[San Luis Obispo Co.]
1339 Pearl St., Napa, CA 94559 [Napa Co.]
70 Industrial Way, Buellton, CA 93427
[Santa Barbara Co.]
tel: 877/255-1440
website: www.compli-beverage.com

Vinquiry, Inc.

Vinquiry provides analytical services, winemaking products, sensory services, and enological consulting to the wine industry. Each of Vinquiry's California locations — Sonoma County, Napa, Santa Maria, and Paso Robles — offers personalized and expert service for every customer.

To meet current customer needs and desires, Vinquiry has added a new Sensory Scientist, Denise Gardner (Penn State University and Virginia Tech Enology-Grape Chemistry Group). Her Masters Thesis focused on using the Electronic Nose to monitor volatile changes during and after cold soak of Cabernet Sauvignon. Denise offers her Sensory Success Seminar series and several new sensory services at Vinquiry, designed for the development and training of descriptive sensory techniques.

Vinquiry is now offering a series on analyses to measure the effects of Smoke Taint. The analyses include guaiacol, 4-methylguaiacol, 4-ethylphenol, and 4-ethyl-guaiacol. Vinquiry enologists have also worked extensively with fining agents to improve these tainted wines, and can help in the process of reducing the impact of smoke taint.

Along with the newer tests and sensory services, Vinquiry continues to offer basic wine analysis to help winemakers achieve their goals, with a number of in-house consultants available for large consulting projects, and quick conferences to resolve winemaking issues.

For more information, contact:
Vinquiry, Inc.
7795 Bell Rd., Windsor, CA 95492
tel: 707/838-6312; fax: 707/838-1765
e-mail: info@vinquiry.com
website: www.vinquiry.com

PLEASE SEE VINQUIRY AD, PAGE 58.

Soule Building Systems, Inc.

After more than 30 years in the metal building industry, and more than 163 wineries built, Soule knows the capabilities of metal building systems. With this experience in design, fabrication, and erection of metal buildings, Soule provides buildings in an unlimited variety of shapes, sizes, and materials. As a "GREEN" construction alternative, Soule buildings are made with 70% recycled materials, and are energy-efficient.

SOULE BUILDING SYSTEMS
METAL CONSTRUCTION

With a flexible design approach, Soule can provide metal building systems that meet the aesthetic requirements of the design professional, and the budget requirements of the winery owner. In-house detailing capabilities allow Soule to incorporate products from many metal building component manufacturers into one building. The shop can fabricate trims and other architectural elements that metal building manufacturers will not supply.

Design development drawings and construction documents for the metal building are created by the Soule design team – part of the overall project design team which includes the architect, general contractor, and specialty design professionals. Incorporating the major trades from the start of the project reduces the time it takes to complete the construction documents. With fewer revisions, valuable time is saved. Open communication with the design team provides solutions for potential problems in the less expensive design phase rather than during construction.

For more information, contact:
Soule Building Systems, Inc.
475 Portal St., Ste. C, Cotati, CA 94931
tel: 707/793-9277; fax: 707/793-9279
website: www.soulebuildings.com

Castoro Bottling Company

Since 1989, Castoro Bottling has served wineries throughout California with a fleet of high-tech mobile bottling lines. The demand for Castoro Bottling's timely, professional, and knowledgeable service has triggered the bottling of over 60 million bottles of wine with natural cork, synthetic closures, or screwcaps.

Castoro Bottling offers five technologically-advanced mobile bottling lines that arrive on your schedule to serve all your bottling needs. Castoro Bottling can bottle up to 2,500 cases per day, serving any size winery. Custom services include labeling and packaging consultation. Recognizing the need for wineries to offer alternative closures, Castoro Bottling has outfitted two bottling lines with **screwcap** capabilities.

CASTORO BOTTLING Co.
CBC
FILLING YOUR NEEDS

"Our investment in the best equipment and the best people to run that equipment is what sets Castoro Bottling apart," says Niels Udsen. "We anticipate the needs of a winery better than any other bottler simply because I have owned and operated a successful winery for 26 years. Castoro Bottling is a partner who knows and understands your business."

Castoro Bottling Company also offers Velcorin dosing and 187ml bottling. Please call, or visit www.castorobottling.com for more information.

For more information, contact:
Castoro Bottling Company
Niels Udsen
PO Box 954, Templeton, CA 93465
tel: 805/467-2002; fax: 805/467-2004
e-mail: Niels@castorobottling.com
website: www.castorobottling.com

PLEASE SEE CASTORO BOTTLING AD, PAGE 63.

Scott Laboratories, Inc.

Scott Laboratories offers a variety of technical and processing services to wineries.

Scott's laboratory is the senior independent wine laboratory in North America and, since its founding in 1933, has provided analytical services to the wine and spirits industries.

SCOTT LABORATORIES

From the beginning, Scott Labs' service has been consultative in orientation. Problem solving receives equal billing with speed and accuracy.

Besides consultative work, other specialties include fermentation trouble-shooting, filterability testing, and TTB-certified analysis for export.

In addition to outside services, Scott's laboratory provides technical support for customers who use enzymes, tannins, gelatins, and adjuvants offered in Scott Labs' portfolio of winemaking supplies. These products have been shown to be useful winemaking tools that can target specific winemaking problems, such as clarification, color stability, structure, and harsh tannins.

For more information, contact:
Scott Laboratories, Inc.
Maggie McBride, Lab Director
2220 Pine View Way, Petaluma, CA 94954
PO Box 4559, Petaluma, CA 94955
tel: 707/765-6666; fax: 707/765-6674
e-mail: info@scottlab.com
website: www.scottlab.com
Scott Laboratories, Ltd.
950 Brock Rd. South, Unit 1, Pickering,
Ontario L1W 2A1, Canada
tel: 905/839-9463; fax: 905/839-0738
website: www.scottlabsltd.com

PLEASE SEE SCOTT LABORATORIES AD, PAGE 57.

Hinman & Carmichael LLP

The law firm of Hinman & Carmichael LLP, established in 1991, practices exclusively in the field of alcoholic beverage law and represents wine, beer and spirits industry members at all levels, from producer and importer to retailer to marketing agent website operators. The firm is the leading U.S. law firm for Internet alcohol marketing compliance, both direct and through the three-tier system.

The firm counsels clients on a vast array of alcohol beverage regulatory issues, and is experienced in all facets of U.S. alcohol beverage law including: licensing; ABC and TTB hearing and accusation proceedings and regulatory defense; business transactions (distribution agreements and distributor relations, marketing agreements, grape purchase and sale agreements, purchase contracts, royalty agreements, corporate formation and documents, etc); trade practices, and trade practice training; rebates and promotions; and trademark registration.

The firm is politically active, is involved with and supports a great variety of wine and other industry organizations, including Wine Institute, Wine America, Family Winemakers of California, Specialty Wine Retailers Association, California Retailers Association, California Restaurant Association, Golden Gate Restaurant Association, Women for Winesense, Sonoma County Vintners, Hospices of Sonoma, ZAP, Rhone Rangers, Lodi Winegrape Commission, and California Association of Winegrape Growers.

Please visit the firm's website: www.beveragelaw.com.

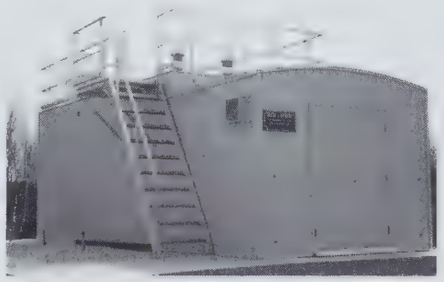
For more information, please contact:
Hinman & Carmichael LLP
260 California St., #1001
San Francisco, CA 94111
tel: 415/362-1215; fax: 415/362-1494
website: www.beveragelaw.com

ADI Systems Inc.

ADI Systems Inc. specializes in industrial wastewater treatment and offers many solutions for wineries, from treatment to water reuse. ADI has installed numerous systems worldwide, including nearly 20 wineries and 50 breweries, distilleries, and alcoholic beverage production facilities, for clients like Anheuser-Busch, MillerCoors, Guinness, and Baileys.

ADI-MBR (Membrane Bioreactor) — A membrane bioreactor (MBR) system, based on the world's leading flat-plate MBR technology, can produce reuse-quality water within an easy-to-operate, small-footprint package. Effluent from the ADI-MBR will meet the strictest discharge requirements, to give a winery a variety of disposal options, including irrigation, aquifer recharge, or direct discharge. The technology is used in 20 wineries worldwide.

Anaerobic Technologies — For large wineries, ADI offers anaerobic systems that are ideally suited to treating high-strength wastewater generated at wineries, and provide an efficient, economical solution to wastewater problems. Wineries can recover the biogas generated in these systems and use it to displace electricity or natural gas use in the winery, providing an additional economic benefit.



Contact an ADI wastewater treatment expert today and explore a variety of solutions to handle wastewater treatment needs at your winery, and improve the overall bottom line. Ask about new ADI-AnMBR technology.

For more information, contact:
ADI Systems Inc.
Al Cocci, Vice President
PO Box 397, 7 Pointe Sewall Rd.
Wolfeboro, NH 03894
tel: 800/561-2831 (US and Canada) or
603/569-0955; fax: 603/569-0957
e-mail: systems@adi.ca
website: www.adisystemsinc.com

PLEASE SEE ADI SYSTEMS AD, PAGE 24.

Turrentine Brokerage

Turrentine Brokerage knows the wine business inside and out. For wine and grape supplies, and to buy or sell grapes or wines in bulk, including international wines, call Turrentine Brokerage.

Call Turrentine Brokerage for win/win negotiations, personal service, and a comprehensive selection of premium wines and grapes. A UC Davis-educated winemaker and a Fresno State-educated viticulturist are on staff. Ask about the *Turrentine Collateral Value Report*, inventory appraisal service, the oft-quoted *Market Update* newsletter for in-depth analysis of the grape and wine markets, and the *Turrentine Outlook*, which provides information available about long-term industry trends.

TURRENTINE
GRAPES & WINE

Turrentine has a record of predicting wine business trends, and helping clients profit from them. Turrentine knows the sources of supply, history and capabilities, the brands, people, and finances. Turrentine earns trust and guards confidences carefully; makes deals happen; bring businesses together efficiently, creatively, and quickly. Turrentine understands the key factors that make your business tick, and how to avoid many hidden disasters.

For more information, contact:
Turrentine Brokerage
Steve Fredricks, Vice President/
Managing Partner
Michael Robichaud, Broker/Partner
Brian Clements, Senior Partner
Larry Kavanagh, Broker
Erica Moyer, Broker/Partner
Bill Turrentine, President/Partner
Matt Turrentine, Broker
Steve Robertson, Broker/Partner
Stephens Moody, Broker
7599 Redwood Blvd. #103, Novato, CA 94945
tel: 415/209-9463; fax: 415/209-0079
e-mail: info@turrentinebrokerage.com
website: www.turrentinebrokerage.com

PLEASE SEE TURRENTINE BROKERAGE AD, PAGE 21.

WineWeb Enterprises, Inc.

WineWeb® provides a suite of cost-effective services for wineries, including websites, e-commerce sales processing, point-of-sale, e-mail campaign management and e-Marketplace promotion services. WineWeb can create and host a unique, effective, and robust website with their winery-specific content management system, unlimited email accounts, traffic statistics, blog and much more. Anytime-access to your content allows website maintenance by non-technical winery staff. Order fulfillment tools, custom data exports, and application integration reduce staff labor requirements.

WineWeb®

WineWeb's online order processing service is customized to the needs of wineries and includes fully compliant shopping cart, credit card processing, shipping carrier integration, age verification, fulfillment center routing, and order fulfillment tools. The e-commerce service can be integrated into an existing website, and includes both direct-to-consumer and direct-to-trade sales.

WineWeb services integrate with other winery applications, and provide tools to manage a winery's online sales channel and customer repository. Advanced features include multiple users, role-based security, event reservations and ticketing, gift certificates, sales dashboard and reporting module, with additional components for wine club member management, email campaigns, and affiliate sales.

Since 1995, WineWeb provides cost-effective Internet services to wineries. WineWeb provides small winery value with a large winery feature-set, with no contract commitment period. WineWeb earns its customers' business each month.

For more information, contact:
WineWeb Enterprises, Inc.
1 Stone Ridge Rd., Santa Fe, NM 87505
tel: 888/236-0058; fax: 888/236-1439
e-mail: sales@wineweb.com
website: services.wineweb.com

PLEASE SEE WINEWEB ENTERPRISES AD, PAGE 56.

Dickenson, Peatman & Fogarty

The attorneys and other professionals of Dickenson, Peatman & Fogarty (DP&F) provide a full range of legal services to wineries, grape growers, wholesalers, retailers, and various businesses that serve the wine industry, from coopers and glass manufacturers to printers and shipping companies. DP&F's wine industry clients are located in wine regions throughout the U.S. and abroad, and range from multi-national corporations to small, family-owned wineries and vineyards.

Unlike many other law firms that maintain a small wine industry practice group, every DP&F attorney in every practice group works daily with wine industry clients. While any law firm can provide advice and counseling on business issues, real estate and land use, intellectual property, labor and employment, succession planning or litigation, DP&F can provide representation in these areas with the added expertise that comes from working with wine industry clients for more than 40 years.

DICKENSON PEATMAN & FOGARTY

DP&F provides representation on issues unique to the wine industry, with an entire legal team dedicated to federal and state alcohol beverage licensing and compliance, including a former California ABC District Administrator and TTB law clerk.

Alcohol beverages are among the most highly regulated products in the U.S. When choosing legal counsel, shouldn't wineries choose counsel with experience serving the needs of the wine industry?

For more information contact:
Dickenson, Peatman & Fogarty
J. Scott Gerien, Esq.
809 Coombs St., Napa, CA 94559
tel: 707/252-7122; fax: 707/255-6876
website: www.dpf-law.com

Exchange Bank

Exchange Bank's Commercial Banking team of experienced lenders understands the unique needs of the wine business. From growing young vines to producing fine wines, Exchange Bank can provide financing. The Bank's internal lending capacity and experienced staff enable it to meet the growing credit needs of wineries and growers throughout the North Coast of California.

Exchange Bank

The Commercial Banking team works with each individual client to determine which products and services will work best for their unique situation. The Commercial Banking team often partners with Dumac Leasing, a Division of Exchange Bank, which offers equipment financing for wineries and other businesses.

Recognized as the Best Business Bank and Best Company to Do Business With in the North Bay, Exchange Bank lives up to high standards of customer service.

Exchange Bank offers fast, local decisions, flexible terms, and more than 119 years of experience. Member FDIC.

For more information, contact:
Exchange Bank, Member FDIC
Steve Herron, SVP Commercial Banking Manager
tel: 707/524-3102
website: www.exchangebank.com

PLEASE SEE EXCHANGE BANK AD, PAGE 29.

Government Liaison Services, Inc.

Government Liaison Services (GLS) was founded in Washington, D.C. (1957) to provide businesses with access to Federal Government offices and the vast amount of information available there.

Today, GLS has a large staff of experts trained in various areas, including intellectual property research, and food and beverage labeling and compliance. All associates are college graduates whose average experience exceeds 20 years.

For more than 50 years, GLS has obtained TTB (formerly BATF) label approvals, along with pursuing rulings on formula submissions, lab analysis results, advertising, and many other TTB matters for thousands of clients, including wineries, law firms, sole practitioners, Fortune 500 companies, and smaller-size businesses throughout the U.S. and the world.

GLS specializes in performing trademark, patent, and copyright search services and is the only major trademark search firm that routinely searches both a computerized database of Federal trademark records, and records from the U.S. Patent and Trademark Office's library, including all "24-hour box" records.

The GLS standard turnaround time for trademark searches is 48 hours. The firm's location in Arlington, VA allows first-hand consultation and guidance from U.S. Patent and Trademark Office officials.

For more information, contact:
Government Liaison Services, Inc.
200 N. Glebe Rd., #321, Arlington, VA 22203
tel: 800/642-6564, or
703/524-8200 outside U.S.
fax: 703/525-8451
website: www.trademarkinfo.com

PLEASE SEE GOVERNMENT LIAISON SERVICES AD, PAGE 32.

Hall & Bartley

Hall & Bartley is a full-service architectural firm specializing in the design and master planning of wineries. Pictured is the new tasting room for Merriam Vineyards in Healdsburg, CA.

Hall & Bartley's unique talents go beyond traditional architecture in their ability to understand and analyze the functional requirements of a modern winemaking facility. Through careful consideration and attention to client's desires, Hall & Bartley remains a leading winery architect in the U.S.

With 25 years' experience, Hall & Bartley are responsible for the design and planning of many premier California wineries including: Flowers Winery, Marimar Torres Estate, Geyser Peak Winery, Chateau St. Jean, Kendall-Jackson's La Crema facility, Atlas Peak Vineyards, Meridian Vineyards, and St. Francis Winery.

Current projects include Sbragia Winery, Sierra de Montserrat Winery, expansion projects for Meridian Vineyards, Asti Winery, Quivira Winery, Skinner Winery, Merriam Vineyards, and an expansion for Bennett Lane Winery.

Hall & Bartley's services include feasibility studies, master planning, process sizing and flow analysis, architectural design, construction document preparation, government permitting assistance, and construction administration for both new and existing winery projects.

For more information, contact:
Hall & Bartley
4701 Old Redwood Hwy., Ste. 2B
Santa Rosa, CA 95403
tel: 707/544-1642; fax: 707/544-1646
e-mail: scott@hallandbartley.com

PLEASE SEE HALL & BARTLEY AD, PAGE 54.

Kennedy/Jenks Consultants

Kennedy/Jenks Consultants has provided consulting engineering services to the wine industry for more than 40 years. They specialize in:

- Planning, design, and construction management for improvements/expansion;
- Wastewater treatment systems;
- Land application systems;
- Water quality/supply;
- Water reuse/recycling;
- Waste minimization/source reduction;
- Storm water management;
- Sustainability and climate action plans.

Kennedy/Jenks' staff also has significant experience developing permitting and regulatory compliance strategies that enable winery projects to move forward. With a history of providing engineering services for wineries of all sizes in California and the northwest, Kennedy/Jenks can recommend cost-effective design alternatives to meet the unique challenges at every location.

Kennedy/Jenks Consultants
Engineers & Scientists

Kennedy/Jenks continues to lead workshops on the *Comprehensive Guide to Sustainable Management of Winery Water and Associated Energy* in winegrowing regions of the U.S. Developed by the company on behalf of Wine Institute and the American Vineyard Foundation, the Guide provides methods for wineries of all sizes to evaluate water-use operations; identify potential improvements; evaluate the feasibility of changes; and implement selected improvements. Wineries are encouraged to consider their operations holistically, so that water use efficiency is achieved along with energy efficiency. Applying this approach and their expertise in related disciplines, Kennedy/Jenks assists wineries with changes that are needed to progress toward sustainability goals.

For more information, contact:
Kennedy/Jenks Consultants
Bob Chrobak, Vice President
tel: 415/243-2524; fax 415/896-0999

PLEASE SEE KENNEDY/JENKS CONSULTANTS AD, PAGE 54.

Hoyt Shepston, Inc.

Hoyt Shepston provides the beverage industry with decades of international transportation experience for both the import and export of beverages and related beverage industry articles. Established in 1850, Hoyt Shepston is one of the nation's, and California's, oldest custom house brokers and freight forwarder/OTIs, offering a full range of international transportation-related services.

Whether shipping one case or a full container by air or sea, Hoyt Shepston's staff of professionals and worldwide network of agents moves cargo with little or no effort by the client, in increments or the total transportation concept, integrating all aspects of international trade between warehouses.

SINCE 1850

Hoyt Shepston has resources and expertise to bring products to and from its various international supply points in a seamless transaction. Hoyt Shepston specialists offer all phases of documentation services, insurance, label approvals, TTB, drawback procedures, duty and quota requirements, letters of credit and more, all backed by 150-plus years of experience.

Hoyt Shepston's headquarters and warehouse are located in South San Francisco with a branch office/marine division located on the Embarcadero in San Francisco, and a worldwide web of national and international agents. Member C-TPAT.

For more information, contact:
Hoyt Shepston, Inc.
Fred Hosking
161-A Starlite St., So. San Francisco, CA 94080
tel: 650/952-6930; fax: 650/952-5691
e-mail: wine@hoyt-shepston.com
website: www.hoyt-shepston.com

PLEASE SEE HOYT SHEPSTON AD, PAGE 44.

Clever Concepts, Inc.

Clever Concepts is a web design firm that specializes in custom winery and vineyard websites. With nearly 100 wine-related customer websites, Clever Concepts has plenty of experience creating websites for wineries, vineyards, wine associations, wine events, and wine-related professional services.

CLEVER CONCEPTS

Clever Concepts custom builds every website to meet the customer's requirements. From the design to the content management tools, every aspect of the web sites is tailored to the customer's needs. Included are tools to manage events, news, wines, photo galleries, and trade/media files.

E-commerce offerings include a user-friendly order form and shopping cart powered by Clever Concepts' WineOrderForm.com system. Clever Concepts can also create an event registration and ticket system.

WINE ORDERFORM.COM

At the end of the development process, Clever Concepts trains customers on the management of their website. Since tools are unique to each customer and are very simple to use, training typically takes less than one hour.

Web hosting is another service provided by Clever Concepts. Reliable and well-supported hosting packages start at $24.95/month.

Please visit Clever Concepts to view a portfolio of top projects, and contact Clever Concepts for a free consultation and demonstration.

For more information, contact:
Clever Concepts, Inc.
PO Box 4310, Paso Robles, CA 93447
tel: 805/434-9994; fax: 805/434-9995
e-mail: info@cleverconcepts.net
website: www.cleverconcepts.net

PLEASE SEE CLEVER CONCEPTS AD, PAGE 63.

Ledcor Construction, Inc.

Ledcor Construction has been serving the building, civil, industrial, and telecommunications industries since 1947. Its reputation is built on a solid foundation of 60 years of continuous success. The Napa office was established in 2004 to better serve the wine and commercial industries of Napa Valley and Sonoma County. Since that time, Ledcor Napa has been involved in various projects from wineries to hotels, mixed-use, retail and hospitality.

Ledcor's experience is in delivering full construction services:

- conceptual estimating;
- value analysis;
- pre-construction and construction scheduling;
- site utilization/logistics planning;
- bidding and procurement;
- permitting;
- cost control;
- safety management.

Ledcor winery clients include: Cliff Lede Winery, Dancing Hares Winery, Dana Estates Winery, Futo Winery, Gloria Ferrer Winery, Larkmead Vineyards, Nickel & Nickel Winery, and Outpost Winery.

Ledcor is committed to building "Ledcor Lifetime Clients" through accountability, innovation, integrity, and quality.

For more information, please contact:
Ledcor Construction, Inc.
Jeff Baptista, Director of Pre-construction
466 Devlin Rd., Napa, CA 94558
tel: 707/257-5231; fax: 707/259-1257
e-mail: jeff.baptista@ledcor.com
website: www.ledcor.com

Compliance Service of America

Compliance Service of America (CSA) offers expert and effective compliance services for wineries, vineyard owners, and negociants. CSA specializes in crafting compliance solutions for all wine business plans.

CSA has helped hundreds of successful vintners and wine companies to:

- Start a new winery or enter into the wine business;
- Buy a winery or a brand, expand a wine business, add a new tasting room or a warehouse;
- Obtain a DSP to lower wine alcohol content and retain estate bottling claims/report the necessary distilled spirits operations;
- Set up alternating premises and operations;
- Change winery ownership for estate planning — CSA can help with reporting and recommend the best way to establish new ownership to avoid compliance issues;
- Establish or amend viticultural areas.

For more than 20 years, CSA has provided compliance solutions for all segments of the wine industry nationwide. The CSA website provides a FREE library of compliance wisdom and articles at www.CSA-compliance.com. From alternating proprietorships to labeling and wine bonds, these articles provide a wealth of information and are useful for everyone in the industry.

For more information, contact:
Compliance Service of America
Alex Heckathorn, Jay McPherson, Dyana Nedra, Sara Schorske
54476 Mariah Rd., Myrtle Point, OR 97458
tel: 800/400-1353; fax: 541/396-6888
e-mail: csa@csa-compliance.com
website: www.csa-compliance.com

PLEASE SEE CSA AD, PAGE 66.

BevTrac Mobile Quality Systems LLC

BevTrac Mobile Quality Systems LLC (BevTrac) provides a mobile laboratory (a first in U.S. wine industry) that conducts state-of-the-art analytical and microbiological testing onsite (plus a free courier service in Mendocino, Napa, and Sonoma counties). Robust and comprehensive quality assurance and process optimization consulting services are the unique advantage of BevTrac's ability to bring a full service laboratory to wineries.

A wide range of consulting services BevTrac offers to the wine industry includes:

- Microbial troubleshooting and remediation;
- Onsite sanitation assessments, monitoring, and solutions to prevent microbial spoilage of wine;
- Quality assurance assessments and services to help clients produce high quality, safe, and pure products;
- 2,4,6-trichloroanisole (TCA) and 2,4,6-tribromoanisole (TBA) assessment and remediation;
- Process optimization consultation (such as Six Sigma and Lean Manufacturing), to eliminate defects in wine production to prevent downgrades and rework, and increase operating efficiency.
- Pre-harvest grape maturity services in collaboration with Dr. Mark Greenspan (Advanced Viticulture, www.advancedvit.com) to assess vineyard condition and fruit sensorial maturity, and collect statistically-relevant fruit samples for rapid chemical and microbiological analyses at BevTrac's mobile laboratory.

From grape maturity to finished bottle distribution, BevTrac has the expertise and technology to implement quality systems to improve finished wine.

For more information, contact:
BevTrac Mobile Quality Systems LLC
PO Box 1410, Windsor, CA 95492
tel: 800/401-8917; fax: 707/237-5125
e-mail: info@bevtracquality.com
website: www.bevtracquality.com

Spurgeon Painting, Inc.

Founded by Bob Spurgeon in 1976, Spurgeon Painting has provided award-winning painting services to wineries, commercial property owners, and homeowners throughout Napa Valley and Sonoma County for more than three decades. Courteous, well-trained staff is one key reason why winery customers recommend and request Spurgeon Painting's services. Spurgeon Painting is dedicated to timely completion, attention to detail, safe and clean job sites, and unparalleled customer satisfaction.

Spurgeon Painting understands the specialized requirements of the wine industry. Skilled, professional crews are trained in the use of epoxy and urethane coatings for steel and concrete in addition to conventional paints and stains. The finest biodegradable, non-chlorinated cleaners are always used to preserve your delicate winemaking environment. Spurgeon Painting is committed to completing each winery painting project on time, on budget, to exact specifications, and with sparkling and efficient customer service.

Let Spurgeon Painting show the quality that earned the 1993 Painting and Decorating Contractors of America National Award for Excellence in Painting. Visit www.spurgeonpainting.com to view the spectacular work done for some outstanding vintners in wine country. Then, call for a quote on a winery painting project.

For more information contact:
Spurgeon Painting, Inc.
1308 Dynamic St. #8, Petaluma, CA 94954
tel: 707/763-7185; fax: 707/763-5659
e-mail: boyd@spurgeonpainting.com
website: www.spurgeonpainting.com

Axiom Engineers, Inc.

Successful winery projects by Axiom Engineers℠, ranging from 2,000-case boutique wineries to 30,000-ton custom crush facilities, include:

- Gentle fruit handling systems;
- Fermentation and barrel storage;
- Wastewater permitting and design;
- Water systems permitting and design;
- Process piping systems;
- Refrigeration;
- Control system integration;
- Cogeneration and solar energy;
- Receiving and crush pads;
- Catwalk systems;
- HVAC and plumbing;
- Hospitality;
- Cave ventilation and radiant cooling;
- Fire protection and smoke control;
- LEED™ and green building.

AXIOM ENGINEERS℠

Axiom Engineers℠ truly understands that one size or style **does not** fit all. Axiom Engineers℠ use their knowledge and experience to work with the winery team to determine what is right for wine style and the winery's business model.

For more information, contact:
Axiom Engineers, Inc.
Raymond Cole, President
Tim Ryan, VP Industrial Systems
Troy Davis, Project Manager
1712 Jefferson St, Napa, CA 94559-1703
tel: 707/251-1468 (Napa)
tel: 831/649-8000 (Monterey)
e-mail: rayc@axiomengineers.com
website: www.axiomengineers.com

Craig Root & Associates — Tasting Room Consulting

Craig Root & Associates offers cost-effective opportunities to increase profits and enhance the visitor experience in your winery visitor center. An entertaining and informative visit to a visitor center stays in the consumer's mind long after expensive advertising has faded. Many of Craig's services can be accomplished with phone and e-mail — he has created highly successful wine clubs and tasting rooms all over the U.S. without actually visiting the wineries.

Craig Root's consulting services cover several areas of visitor center performance:
1. Complete visitor center start-up (design review, business plan, income/expense projections, wine club creation, tour creation, trade relations, and complete retail room organization);
2. Appraisal of current operations (through direct consulting and/or a "mystery audit" program) to cover all phases listed in #1;
3. Wine clubs (from start-up to fine-tuning an existing program);
4. Trade relations: How to achieve better results with VIP buyers;
5. Seminars designed to improve management and staff performance (**Management seminar** presented at U.C. Davis and Cornell University, **Sales and Customer Service** for staff, and more).

The company's partial client list includes: Acacia Winery, Clos Pegase Winery, DeLoach Vineyards, Domaine Carneros, Heitz Wine Cellars, Indian Springs Winery, Fess Parker Winery, Franciscan Vineyards, Freemark Abbey Winery, Kendall-Jackson Vineyards, Kenwood Vineyards, Roederer Estate, V. Sattui Winery, St. Clement Vineyards, Stag's Leap Wine Cellars, Zaca Mesa Winery, Niebaum-Coppola Winery, and Robert Mondavi Winery.

Root teaches a class at U.C. Davis on Tasting Room Design and Management.

For more information, contact:
Craig Root & Associates
Visitor Management Resources
10 Upland Rd., St. Helena, CA 94574
tel: 707/963-7589; fax:707/963-6009
e-mail: craigaroot@comcast.net
website: www.craigroot.com

Fred Lyon Pictures

Get the photography you want, that will tell your story best.

Fred Lyon is the wine industry's own photographer. He relentlessly prowls vineyards and wineries around the world. You've seen his pictures in all the best magazines and wine books.

For wineries and wine marketers, Lyon creates innovative conceptual images for persuasive advertising and brochures, plus web and press-use. These are high-energy images from an experienced photographer who is friendly, rapid, and reliable.

For a fresh source of available pictures, visit www.winetravelandfood.com.

For more information, contact:
Fred Lyon Pictures
3609 Buchanan St., San Francisco, CA 94123
tel: 415/922-5100; fax 415/922-5762
e-mail: fred@fredlyon.com
websites: www.fredlyon.com;
www.winetravelandfood.com

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Hill & Associates

Since 1985, Hill & Associates has been providing executive and professional search and recruiting services to the premium wine industry. Hill & Associates continues to build successful management teams for many of the most successful companies. Hill & Associates clients range from boutique, ultra-premium wineries to multi-million case producers. Clients include U.S. based wineries and international beverage companies.

Searches are conducted from mid-management to executive level on a national and international basis. Areas of recruiting and placement include general management, sales, marketing, public relations, winemaking, accounting and human resources.

Typical searches include: president, CEO, CFO, CMO, VP of marketing, director and brand manager, national and regional sales manager, controller, accountant, human resource director/manager, winemaker, and vineyard manager.

Every winery is different, and Hill & Associates understands the unique needs. The talent that Hill & Associates recruits has proven track records of success. Hill & Associates works diligently to match the personalities of its candidates with the best positions within the wine industry.

To learn more about Hill & Associates please visit the website: www.BestWineJobs.com

For more information, contact:
Hill & Associates
1370 Trancas St., Napa, CA 94558
tel: 310/925-1241 or 707/258-2000
e-mail: tom@bestwinejobs.com
website: www.bestwinejobs.com

PLEASE SEE HILL & ASSOCIATES AD, PAGE 60.

Scion Advisors®

Scion Advisors has extensive expertise working with family business owners to navigate important business transitions. As business advisors, Scion specializes in building executable plans and teams capable of improving performance, profitability, and long-term business value. The partners are experienced general managers from world?class organizations, who have worked with 100+ companies across several industries.

Hands-on problem solvers, Scion gets at the heart of issues fast, has a proven approach and solid track record of results. Scion is hired during times of complexity, when a plan is needed: succession, fast growth, or solving poor profitability.

Services include:

- Strategic business and financial planning: Market and brand strategy, product, pricing and channel diagnostics, benchmarking and audits.
- Organization strategy and development: Leadership and team assessments, conflict resolution, governance, ownership continuity and succession.

Access Scion's extensive knowledgebase at www.scionadvisors.com.

For more information, contact:
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Steep slopes at RdV Vineyard in Delaplane, VA.

Great Eastern Wine

An inconvenient truth

BY Jim Law,
owner/winegrower,
Linden Vineyards, Linden, VA

Back in the 1970s, a few hardheaded pioneers dared to plant vinifera on their farms in eastern North America. Their goal was to keep the vines alive and make clean, correct wines. That goal has been met from Niagara to Georgia, but while Thomas Jefferson might have been pleased, Robert Parker and *The Wine Spectator* still are not so impressed.

The next step has proven to be more difficult: to make great wine. A handful of winegrowers with a unique combination of intellectual curiosity and practical managerial ability are beginning to meet this challenge.

Most of the focus needs to be in the vineyard, as summer and fall rainfall define eastern viticulture. There is nothing magical about high-end winegrowing in these states. Matching variety with site, disease control, precise canopy management, and rational picking decisions are all givens.

The following six factors, however, have proven to be especially important for the progressive eastern winegrower:

1. Soils that shed water — The eastern U.S. is one of the wettest viticultural regions in the world. Soils with low water-holding capacity are important for any high-end vineyard, and the more rain, the more critical is a site's ability to evacuate water.

Summer rains can encourage excessive and prolonged vegetative growth, especially in deep, water-retentive soils. Getting vines to stop vegetative growth at veraison is one of the great challenges in eastern viticulture, especially for red winegrapes.

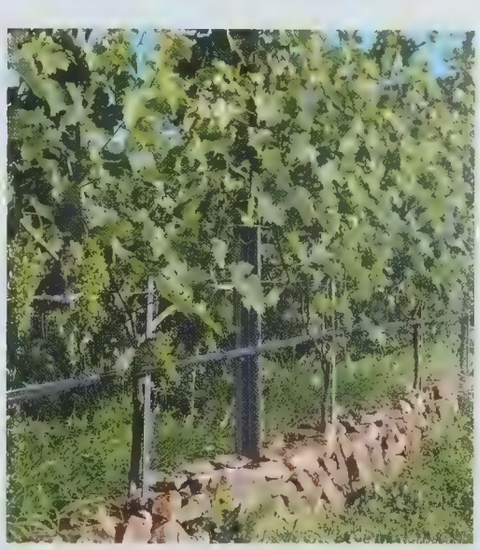
Soils that shed water, either internally (large aggregates, shallow, low organic matter), or externally (on steep slopes) give the most balanced vines, especially in high-density plantings. These soils also keep vineyards healthier and producing longer. Old vines make wines with more complexity and structure, that age well.

2. Yields — As in northern Europe, cloud cover and hazy skies reduce the amount of sun in the East. Vines are less efficient than in a Mediterranean climate. While it is possible to crop vineyards at relatively high amounts, wine concentration and texture will reflect vineyard yields.

Many eastern regions have a plethora of vine and row spacing regimes, along with about every trellis system known to man. Expressing yields in tons per acre, hectoliters per hectare, or pounds per vine is confusing at best.

There is a slow shift to expressing yield in kilos per meter squared of canopy, or pounds per running foot of canopy. One pound of grapes per

25-year-old Cabernet Sauvignon vines trained to Lyre at the "estate" vineyard (named Hardscrabble) at Linden (VA). Grass cover crop competes with vines during a wetter than normal spring.



New high density planting (7'x4') at RdV vineyard. 4-year-old Cabernet Sauvignon with stone wall terracing, and cover crops for a wet spring.

canopy foot (1.5 kilos per meter) is typically the yield goal for concentrated reds, with a bit more for whites.

3. Permanent skilled labor — This includes both management and vineyard workers. The eastern climate presents two unique circumstances: cold winters and variable weather during the growing season. This leads to what some refer to as "replacement viticulture."

Vineyards are not uniform because of regular trunk or cordon renewal and individual vine replanting in established blocks. Pruning, shoot and crop thinning, and even harvest involves individual vine attention and decision-making adjustments. Contract crews or casual labor cannot be expected to make these decisions.

Vineyard managers have to constantly readjust strategies during the growing season, mainly because of the variable rainfall and resulting vigor and disease issues. Timing is everything when it comes to spraying, shoot positioning, and leaf pulling. Experience in the same vineyard over many years makes for a much more consistently balanced vineyard.

Winemakers cannot plan for anything in the East. Only experience with the same vineyard will teach winemakers which varieties or blocks can hang through a three-day rain in September, how to handle botrytized Cabernet Franc, or how much bleeding is reasonable when Merlot berries come in swollen after a rain.

4. An experienced palate — Numbers and lab results only serve as backup data for palate-based winemaking, as there are too many variables that cannot be measured. Decision making — from harvesting, to extraction, to blending — is all palate- and experience-based. The most successful eastern winegrowers have trained their palates through tasting and study.

The focus needs to be on benchmark European wines from regions where it rains during the growing season. How did the Bordelaise make such stunning reds in the seemingly mediocre 2008 vintage? How did the Burgundians make such mineral, focused whites with all the rot and mildew pressures in 2006?

5. The courage to do nothing — "Fear-based" is perhaps the best way to describe eastern winemaking philosophy. The goal is to make a safe wine. Under our conditions this often involves copious use of additives and manipulation.

How can we learn the character and potential of our vineyards if we add acid, tannins, concentrates, and enzymes? Progressive winegrowers are learning that, in order to produce wines of character and "somewhereness," they need to trust their grapes. As vineyard management and site selection evolves, cellar manipulation diminishes.

6. Declassification — One of the reasons that Bordeaux wines have improved so much in quality over the past 20 years is the introduction of "second" wines. Strict and honest declassification is essential if eastern wineries are to consistently bottle "prestige" wines.

We can have vintages like 2003 where 100% of the wines are declassified down to a lower label, and other years such as 2007, where only a few odd lots and some press wines are cut out.

Declassification is all palate-based. The key is to have a profitable place for the declassified lots to go. Most eastern wineries do a brisk business with direct sales (tasting rooms or festivals). These are great avenues for selling "Clarets," "regular" Chardonnays, or kitchen-sink blends.

We used to see our climate as our great disadvantage. However, a paradigm shift is emerging, as much improved vineyard management and a better understanding of site/variety relationships lead to balanced wines with concentration, savory complexity, and ageability.

As the trade and public tire of high-octane fruit bombs, eastern winemakers are in a great position to distinguish ourselves. This takes an enormous amount of time and dedication. Presently only a handful of wineries are in a position to do this.

Most are still consumed with catering to "regional palates" and are guided more by entrepreneurial impatience than the focus required to make fine wines. This scenario is changing, as many newer entries have the site, the business model (capital), a palate, an experienced team, and a goal to produce a great wine from the East. Stay tuned. ■

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CALENDAR

November 5, 9AM-5PM
Napa Valley Wine & Grape Expo
Lincoln Theater, Yountville, CA

A highly-focused educational opportunity for premium winegrape growers/producers. Presentations will focus on specific vineyard practices as they relate to wine quality. The seminar schedule will include guided wine blending trials, a Spanish seminar with educational tasting, a tradeshow with 60 leading viticulture and enology companies, and Hosted Wine Bar [3:30pm]. Napa Valley Wine & Grape Expo is presented by the Napa Valley Grapegrowers. For the complete seminar schedule and tickets, please call 707-944-8311 or visit www.napagrowers.org.

ETS Laboratories and Scott Laboratories open Healdsburg, CA satellite

Scott Laboratories, Inc. and ETS Laboratories announce new offices and a satellite laboratory at 190 Foss Creek Circle, Suite G, Healdsburg, CA.

Scott Laboratories stocks its traditional fermentation portfolio, including products from Lallemand, Laffort, Anchor and Fordras, plus the Enoferm product range of Lallemand. The Scott team in Healdsburg includes Nichola Hall and Sara Gibbs.

ETS Laboratories will offer their full range of services, including manual and automated chemistry using sequential auto-analyzers, FTIR, and flow injection techniques. The laboratory will be staffed by two of ETS' most senior employees. There is frequent courier service throughout Sonoma County. ETS technical experts will regularly be available un Healdsburg to discuss technical questions and provide seamless integration with the ETS St. Helena facility.

New GIS-based tool for growers

SureHarvest introduces Farming InSight, a GIS-based decision support and reporting tool providing growers a visual display of farming data from anywhere, at anytime for Harvest 2009. "With Farming InSight, we can provide growers an analytical tool to visualize what is happening in the field at any given moment," states Robin Wood, SureHarvest Chief Technology Officer, "and provide timely analysis for growers to make quick farming management decisions.

"Farming InSight integrates farming data with a GIS-map to provide a visually powerful way to best allocate resources. For example, using a web browser, a grower can see the history of water applied by block, which blocks are stressed, and make irrigation decisions according to the quality target of each block."

Farming InSight ranch maps are displayed in a web portal with collapsible window panes to view and drill down into source data. Farming InSight reports are generated by retrieving data collected in SureHarvest Farming MIS, a comprehensive database management software tool to track all farming activities, including scouting, chemical-fert applications, irrigation, harvest, and labor management.

For more information, call SureHarvest [831/477-7797] or visit www.sureharvest.com. ■

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COMPLIANCE COUNSELING *by Rachel Dumas Rey*

New opportunities for tasting rooms, winery-restaurants

Wine consumption at winery picnic areas and restaurants means higher revenues from direct sales but more responsibility for winery owners.

In California, wine enthusiasts have always been able to visit winery tasting rooms to sample their wines, usually in a one-ounce pour. A few wineries also had restaurants, where consumers could order wine by-the-glass or bottle.

Often, though, tasters have purchased a bottle of wine in the tasting room and taken it outside to enjoy with a picnic lunch in one of the public areas near the vineyard or on the winery's patio. Although this kind of onsite consumption has been fairly common, many tasting room managers and consumers have been unclear about its legality.

A new law — AB 2004, the so-called "Picnic Bill" — opens the door to a variety of opportunities for wineries to sell wine for onsite consumption, including sales by-the-glass, by-the-bottle, or any amount in between. Signed by Governor Arnold Schwarzenegger in July 2008, the law took effect on January 1, 2009.

In addition, a less well-known privilege allows California wineries to open an onsite restaurant with no additional permit requirements.

Legal wine consumption in picnic areas and winery restaurants creates new and profitable sales opportunities for California wineries, but these privileges come with much greater responsibility.

AB 2004 privileges and restrictions

AB 2004 was originally intended to clarify the legality of selling a bottle of wine that is then consumed in a winery's picnic area, but it also outlines a variety of privileges that winegrowers with Type 02 licenses may exercise. The law amends Section 23358 of the California Business and Professions Code and authorizes winegrowers to sell wine and brandy for consumption on the premises at the primary licensed facility. A winery may now sell wine for consumption from the tasting room, if it is located

BONNY DOON VINEYARD
CELLAR DOOR CAFÉ

Only Bonny Doon Vineyard wines are available at the Cellar Door Café. It is open Wednesday through Sunday, 5:30 PM to 9 PM Wednesday and Thursday, and noon until 9 PM Friday, Saturday, and Sunday.

The menu includes six small plate offerings, one snack plate, one cheese plate, one dessert, and a changing family-style prix fixe three-course dinner at $28 per person, plus wine by-the-glass suggestions ($7 to $12). Each day, a different wine is selected to pair with that day's unique dishes.

Customers can choose wines by the glass or bottle, in flights of three two-ounce pours ($9 to $20 and above), and in quartinos (⅓ bottle at $9 to $24, see photo). By the glass, wines are $7 to $18 (see photo).

Bottles are marked up $10 over retail price and range from $25 to $60. The menu encourages customers to "Ask your server about the perfect pairing for your meal today."

on the same site where the wine is produced.

Consumers may purchase a glass or bottle of wine and then drink it in any location included in the physical area covered by the winegrower's license — be it tasting room, designated picnic area, garden, deck, or patio.

In many cases, a winery parcel in its entirety is not licensed by the California Department of Alcoholic Beverage Control (ABC), so it is important for the winery to review its ABC application documents to ensure that the hospitality areas are included as part of the licensed area. If these areas are not part of the licensed premises, wineries should not allow patrons to drink there. If they do, they might be cited for misconduct. The ABC will enforce some sort of "containment" system, such as roping or hedges, to define the licensed areas.

To cover or expand its hospitality areas, a winery may need to file a new premises diagram using ABC Form 257 (NR). The addition of a picnic area for consumption typically will not trigger any changes to a winery's Federal Basic Permit. There are no fees associated with this filing, and it can be done immediately if you make an in-person appointment at the ABC. If you choose to mail in your request, the filing will only take a few weeks.

Advice and assistance are available from Compli, Beverage Industry Compliance (www.compli-beverage.com), and other compliance agencies.

Be aware that local governments may restrict these new rights, so it is important to check for limitations with the local ABC office or the agency that issued the winery's land use permit. (Local agencies may restrict, but not eliminate, a winery's privileges under the state code.)

If a winery operates a secondary or separate tasting room, in a commercial retail area or anywhere else away from the production location, it must restrict servings there to one ounce, and bottles purchased there must be consumed offsite. These satellite tasting rooms may charge for tasting, but they operate under a duplicate winegrower license and do not have the Type 02 license privileges that allow onsite consumption of a full glass or bottle.

CALCAREOUS
VINEYARD

Calcareous Vineyard bottles 13 wines. Five to seven of the wines are included in a $5 tasting fee. All wines by-the-glass are $7 to $9 for a 6 oz. pour.

"Our goal at Calcareous Vineyard is to educate each guest about our wines," explains Dana Brown, owner. "We want to convey the importance of our calcareous (limestone) soil and why this important component produces such distinct and delicious wines. Our motto is 'Let the soil speak.' We do this by making our wines in the most natural way. We strive to make each experience memorable by educating our guests."

Visitors enjoy wine-by-the-glass outside tasting room.

Wineries with satellite tasting rooms and alternating proprietors have objected to being left out of this new opportunity. ABC excluded duplicate licensees because there is no public posting or 30-day opportunity for the public to comment or protest before the applicant is allowed to open for business. However, the ABC has indicated that it may agree to support a change if duplicate winegrower license applications are subject to the more traditional, 30-day public notice procedure.

Winery restaurant regulations

The California Business and Professions Code also allows winery restaurants. In the past, many winery owners did not know about or take advantage of this opportunity. But with the changing economy, more and more of them are looking for ways to reach new consumers and create loyal customers. The increase in winery restaurants is a growing trend in urban areas and in newer wine regions, such as Temecula.

Regulations state that a licensed Type 02 Winegrower is authorized to sell all wines, beers, and brandies, regardless of source, to consumers for consumption on the premises in a bona fide eating place that is:

- located on the licensed premises or,
- located on premises owned by the licensee that are contiguous to the licensed premises, and
- operated by and for the licensee.

(For more information, go to www.abc.ca.gov/forms/abc616.pdf.)

A bona fide eating place on the grounds of a winery must meet certain standards. The California ABC requires that winery restaurants must be open to serve meals to guests for compensation and must have suitable onsite kitchen facilities. The kitchen must comply with all regulations of the local department of health, and must have sufficient refrigeration to store food and equipment to cook an assortment of foods that may be required for meals.

By "meals," the ABC means the typical assortment of foods commonly ordered at various hours of the day. A menu of only sandwiches or salads is not sufficient. "Guests" refers to persons who, during the hours when meals are regularly served, can come to this public eating place and order and eat a meal.

Unlike non-winery restaurants, which may sell unopened bottles of any wine for consumers to take home, winery restaurants may sell only their own wine for consumption off the premises. (Adapted from Section 23038 of the Business and Professions Code, Alcoholic Beverage Control Act.)

Licensing requirements for winery restaurants are similar to those for picnic areas. Winery restaurateurs must submit a diagram showing the winery production space, tasting area, and restaurant on ABC Form 257. They may also have to provide the local ABC office with a menu. Local health

department approval is required, and local governments may apply restrictions to restaurant operations.

Winery managers who decide to serve by-the-glass or bottle should double-check their licensing documents, as any violations in this area can jeopardize the entire winery operation.

Area of concern

The expansion of service at wineries has led to concerns about drinking and driving. Tasting room staff are not bartenders, but the additional wine-service opportunities resulting from AB 2004 may require revision of the tasting room policies or additional training in responsible hospitality and in checking patron identification.

The ABC provides pro-active training for responsible beverage service to restaurant and bar employees, but no one is actively training winery tasting room staff, so the winery must take on the responsibility.

Winery operations that already serve alcohol in their tasting rooms and adjacent restaurants say they train their employees to check for proper identification and teach them how to handle an intoxicated guest. Wineries might offer specials or services for designated drivers, as many have done for groups of tasters, to encourage patrons to travel safely away from the winery.

Any winery employee who believes that a patron has consumed too much alcohol or that a patron's ability to drive is compromised should stop serving that guest. Employees can help an intoxicated guest identify alternative transportation, such as a cab.

What winery operators are saying

Dana Brown, owner of Calcareous Vineyards (Paso Robles, CA), has taken advantage of the new sales opportunities presented by AB 2004. "On any given weekend, sales of wine by-the-glass may represent 3% to 5% of wine sales. We see a greater impact during events.

"During Paso Robles industry-wide events, we offer a package which includes the visitor's first glass of wine in the ticket cost. This allows us to budget more accurately. Customers are more conscious of their consumption as they have to purchase each additional glass. Staff also has better control over monitoring excessive consumption.

"Our staff is more aware as well. We hold weekly meetings to discuss checking identification, how to approach intoxicated people, how to identify problem drinkers and what to say to them, and how to identify a designated driver."

In October 2008, Bonny Doon Vineyard moved its tasting room from the hamlet of Bonny Doon, CA, to its new location adjacent to the winery on the west side of Santa Cruz. Burke Owens, Director of Marketing and Communications at Bonny Doon, reports that revenues have been significantly increased by the addition of the winery restaurant, which got a new name, Cellar Door Café, and an expanded café dining section in May 2009. "With our chef Charlie Parker and our new location in Santa Cruz," says Burke, "we have a constant flow of diners and drinkers buying food and wine."

Owens credits the restaurant and AB 2004 with "improving the consumer's overall experience and our revenue greatly. We have seen a huge increase in the sales of quartinos [small decanters] on premises, which brings us more revenue and a growing and loyal following."

Because of the restaurant/café , the winery has extended its hours until 9:00 PM. "We have more hours to sell, and we sell more wine," Burke adds. He notes that operating costs have also increased, with longer hours, food service costs, and added staff for the restaurant and the tasting room.

With regard to training, Burke continues, "We are very strict about checking IDs. We train employees to spot non-standard forms of identification, and we turn down customers if their ID is not standard." Burke and his staff meet regularly to discuss the challenges associated with dealing with intoxicated people. The manager on duty will approach anyone who appears to have had enough with an offer of coffee and water, and the person will not be served any more wine.

Bottom line

Direct-to-consumer sales are the foundation for successful business for most California wineries, and the regulatory framework now offers more direct sales opportunities and options for reaching and keeping customers. However, wineries will have to institute new policies and staff training to prevent problems with guests who drink and drive from their wineries. This, plus a thorough understanding of the regulations and compliance, will ensure the continued success of wineries as they venture into these new areas.

Downtown Paso Robles, CA is home to 14 wine tasting rooms that hold duplicate winegrowers licenses. All but one of these wineries lack the option of an on-site tasting room because they are alternating proprietors operating at a larger host facility. Those that I polled are cautiously optimistic about the possible change. More to come. ■

Rachel Dumas Rey is president of Compli, a full service beverage compliance firm in Paso Robles, CA. Prior to establishing Compli in 1997, she worked for the U.S. Department of Commerce Export Administration in Washington, DC.

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